

N32G030 x6/x8

Product Brief

N32G030 series based on Arm® Cortex®-M0, run up to 48MHz, up to 64KB embedded flash, 8KB SRAM, integrated analog interface, 1x12bit 1Msps ADC, 1xOPAMP, 1xcomparator, integrated multi-channel U(S)ART, I2C, SPI and other digital communication interfaces.

Key feature

● Core

- A 32-bit general-purpose microcontroller based on the Arm® Cortex®-M0 core, Single-cycle hardware multiply instruction
- Run up to 48MHz

● Encrypted memory

- Up to 64KByte embedded Flash memory, supports encrypted storage, supports hardware ECC verification, data 100,000 cycling and 10 years of data retention
- SRAM of 8KB, supporting hardware parity

● Low-power management

- Stop mode: RTC Run, maximum 8KByte SRAM retention, CPU register retention, all IO retention
- Power Down mode: support 3 IO wakeup

● Clock

- HSE: 4MHz~20MHz external high-speed crystal
- LSE: 32.768KHz external low-speed crystal
- HSI: Internal high-speed RC OSC 8MHz
- LSI: Internal low-speed RC OSC 30KHz
- 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

- Support power-on/power-off/external pin reset
- Support watchdog reset

● Communication interface

- 3xU(S)ART, with a maximum rate of 3 Mbps, of which 2 USART interfaces (support 1xISO7816, 1xIrDA, LIN), 1 of which support low power (LPUART, the highest communication rate in this mode is 9600bps) ,Stop mode can be awakened
- 2xSPI, up to 18 MHz, one of which supports multiplexing with I2S
- 2xI2C, the rate is up to 1 MHz, which can be configured in master/slave mode and support dual address response in slave mode

● Analog interface

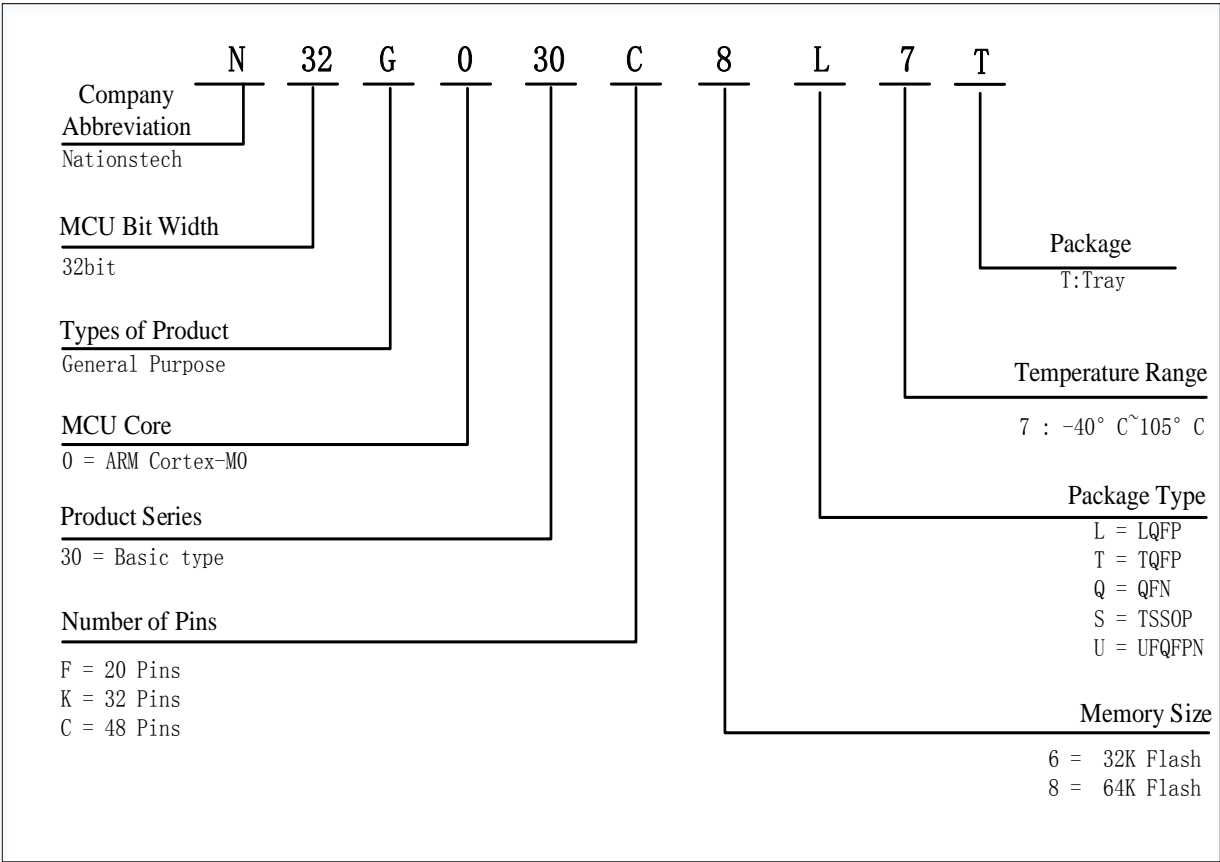
- 1x12bit 1Msps ADC , up to 12 external single-ended input channels
- 1xOPAMP, internal programmable gain amplifier up to 32 times

- 1xCOMP (Comparator has an internal independent 6bit DAC)
- **Up to 40 GPIOs**
- **1xDMA, 5-channel, channel source address and destination address can be arbitrarily configurable**
- **1x RTC real-time clock, support leap year perpetual calendar, alarm event, periodic wake up, support internal and external clock calibration**
- **1xBeeper, support complementary output, 16mA output drive capacity**
- **Timer counter**
 - 2x16-bit advanced timer counters, support input capture, complementary output, orthogonal encoding input, each timer support 4 independent channels. Each timer support 3 pairs complementary PWM outputs
 - 1x16-bit general purpose timer counters, 4 independent channels, supports input capture/output compare/PWM output
 - 1x16-bit basic timer counters
 - 1x16-bit low power timer counter. support single pulse and double pulse counting function, can work in STOP mode
 - 1x24-bit SysTick
 - 1x7-bit Window Watchdog (WWDG)
 - 1x12-bit Independent watchdog (IWDG)
- **Programming mode**
 - Support SWD online debugging interface
 - Support UART Bootloader
- **Hardware Divider(HDIV)and Square Root(SQRT)**
- **Security features**
 - Flash storage encryption
 - CRC16/32 calculation
 - Support write protection(WRP), multiple read protection(RDP) levels (L0/L1/L2)
 - Support external clock failure detection, tamper detection
- **96-bit UID and 128-bit UCID**
- **Working conditions**
 - Operating voltage Range: 1.8V~5.5V
 - Operating Temperature Range: -40℃~105℃
 - ESD: ±4KV (HBM model), ±1KV (CDM model)
- **Package**
 - UFQFPN20(3mm x 3mm)
 - TSSOP20(6.5mm x 4.4mm)
 - QFN32(4mm x 4mm)
 - QFN32(5mm x 5mm)
 - LQFP32(7mm x 7mm)
 - LQFP48(7mm x 7mm)
 - TQFP48(7mm x 7mm)

● **Order model**

Series	Part Number
N32G030x6 N32G030x8	N32G030F6U7 ,N32G030F6S7 N32G030K6L7,N32G030K6Q7,N32G030K6Q7-1 N32G030K8L7, N32G030C8L7, N32G030C8T7, N32G030F8S7

1 Part number information



2 List of devices

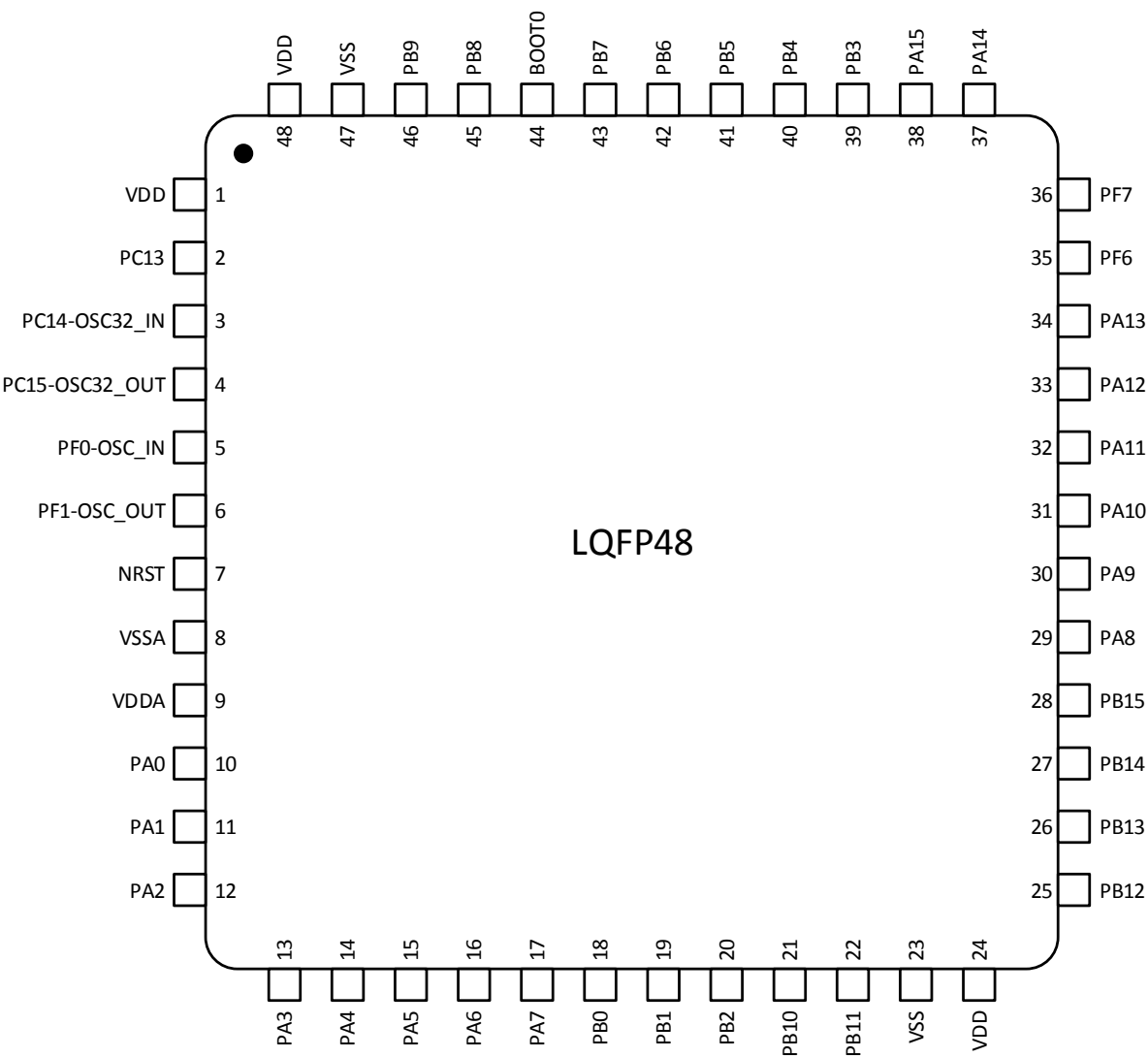
Table 2-1 N32G030 Series devices features and peripheral list

Part Number		N32G030 F6U7	N32G030F6S7	N32G030K6Q7	N32G030K6Q7-1	N32G030K6L7	N32G030K8L7	N32G030C8L7	N32G030C8T7	N32G030F8S7
Flash capacity (KB)		32	32	32	32	32	64	64	64	64
SRAM capacity (KB)		8	8	8	8	8	8	8	8	8
CPU frequency		ARM Cortex-M0 @48MHz								
working environment		1.8~5.5V/-40~105℃								
Timer	General	1								
	Advanced	2								
	Basic	1								
	LPTIM	1								
	RTC	1								
communication interface	SPI	2								
	I2S	1								
	I2C	2								
	USART	2								
	LPUART	1								
GPIO		16		28		26		40		16
DMA Number of Channels		5								
12bit ADC Number of channels		1x12bit 7Channel	1x12bit 9Channel	1x12bit 10Channel				1x12bit 12Channel		1x12bit 9Channel
OPA/COMP		1/1								
Beeper		1								
Algorithm support		CRC16/CRC32								
security protection		Read and write protection (RDP/WRP), storage encryption								
Package		UFQFP N20	TSSOP 20	QFN32 (5mx5mm)	QFN32 (4mx4mm)	LQFP32	LQFP32	LQFP48	TQFP 48	TSSOP 20

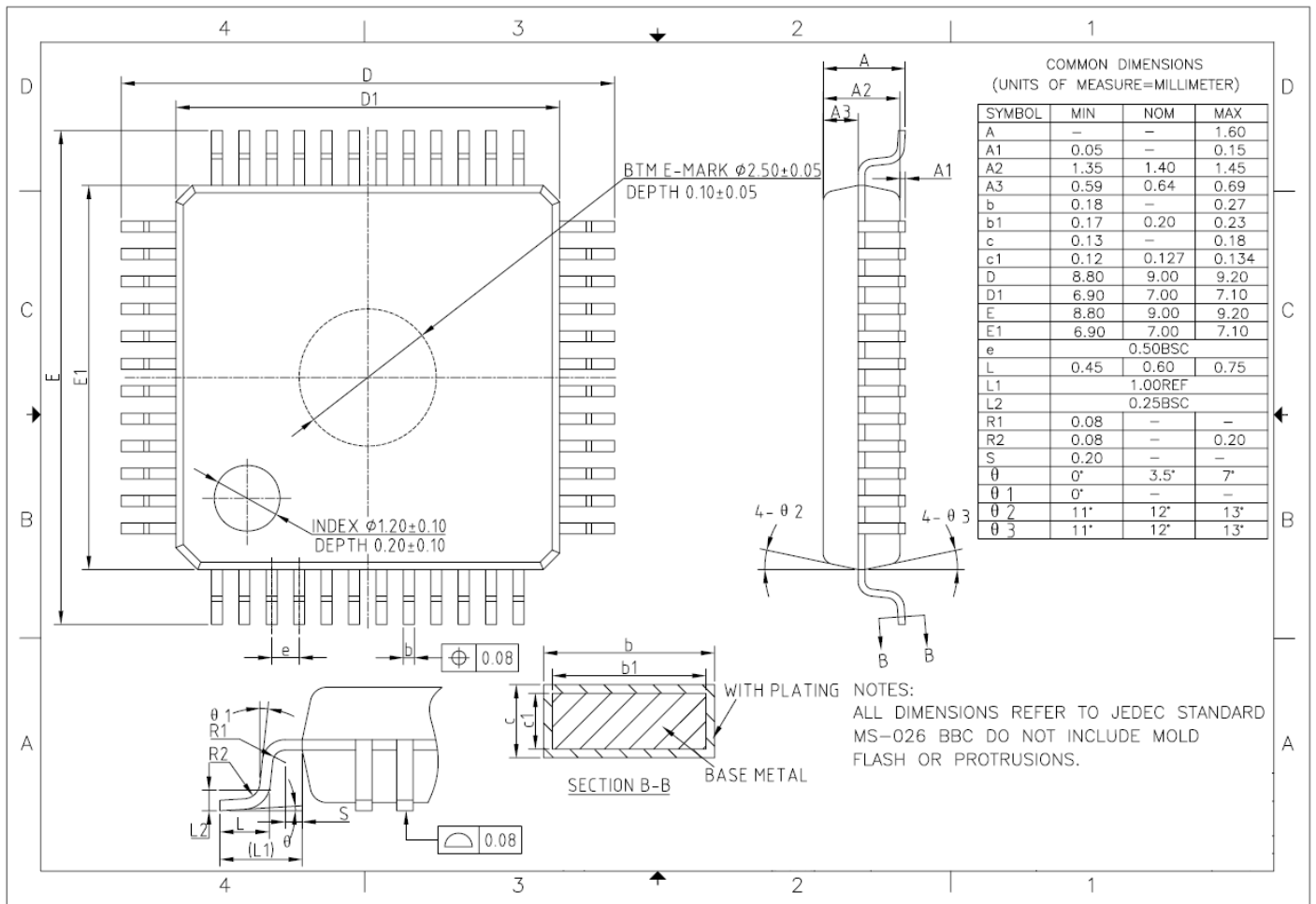
3 Package information

3.1 LQFP48

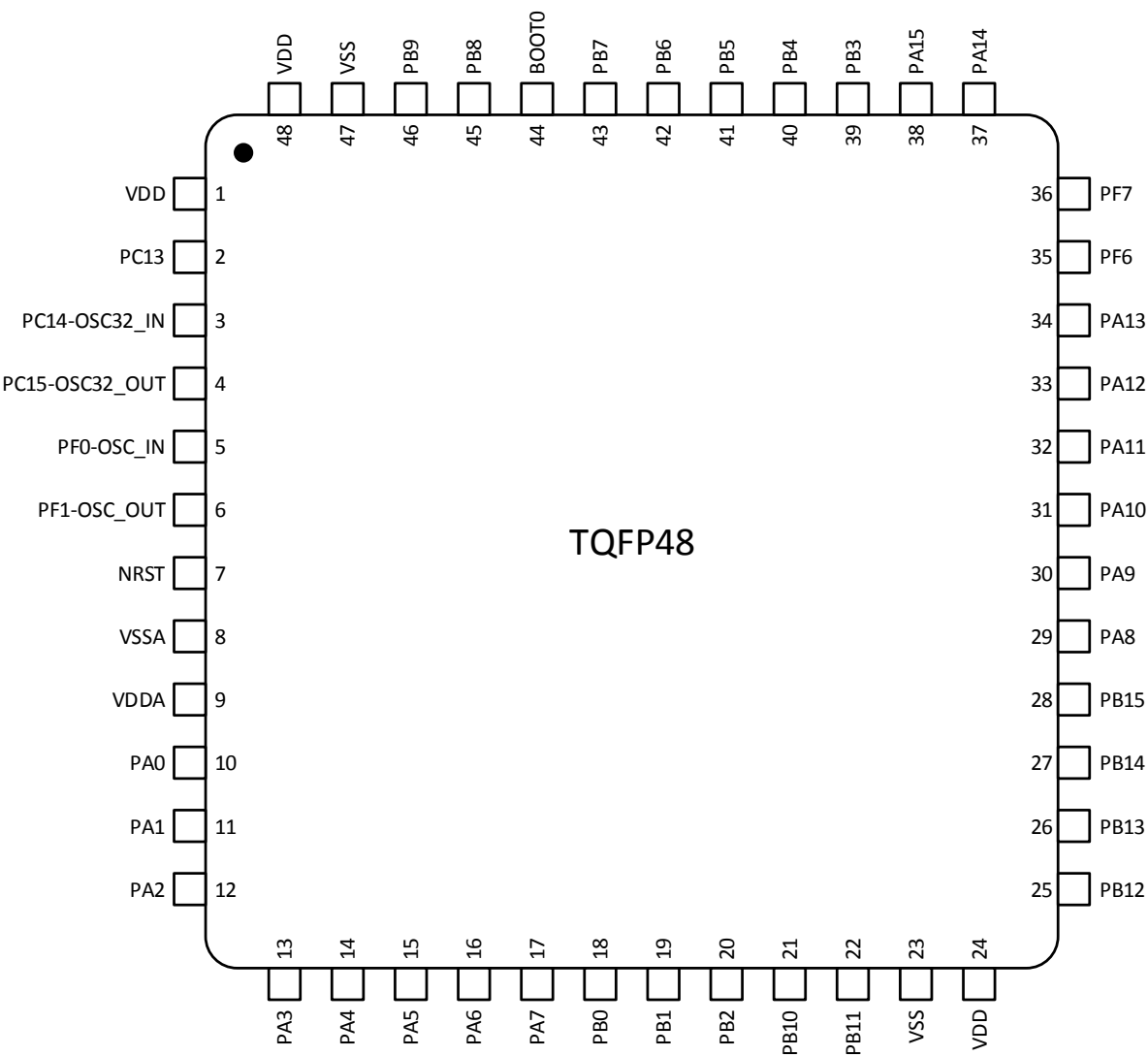
3.1.1 LQFP48 pinouts



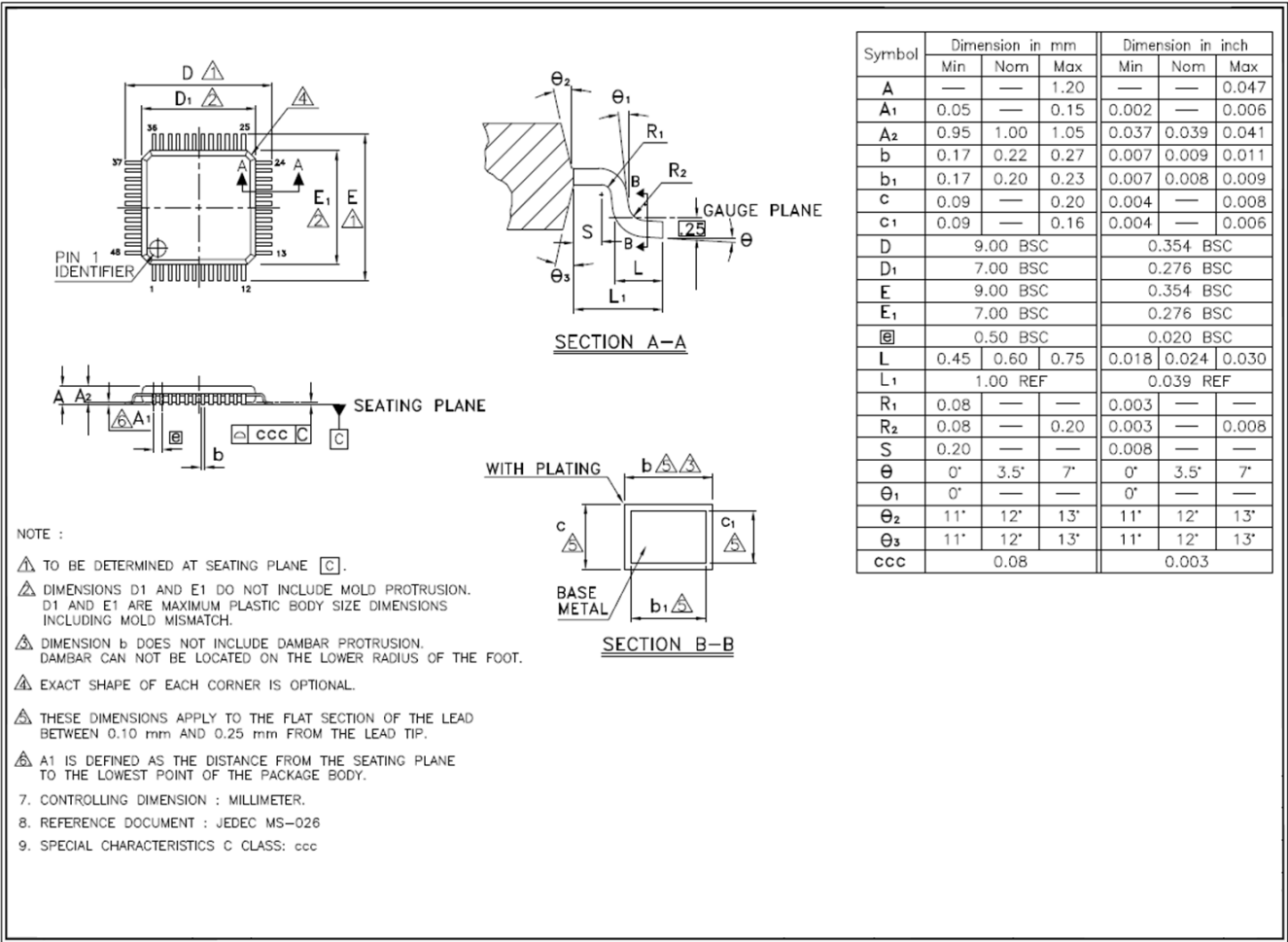
3.1.2 LQFP48 package



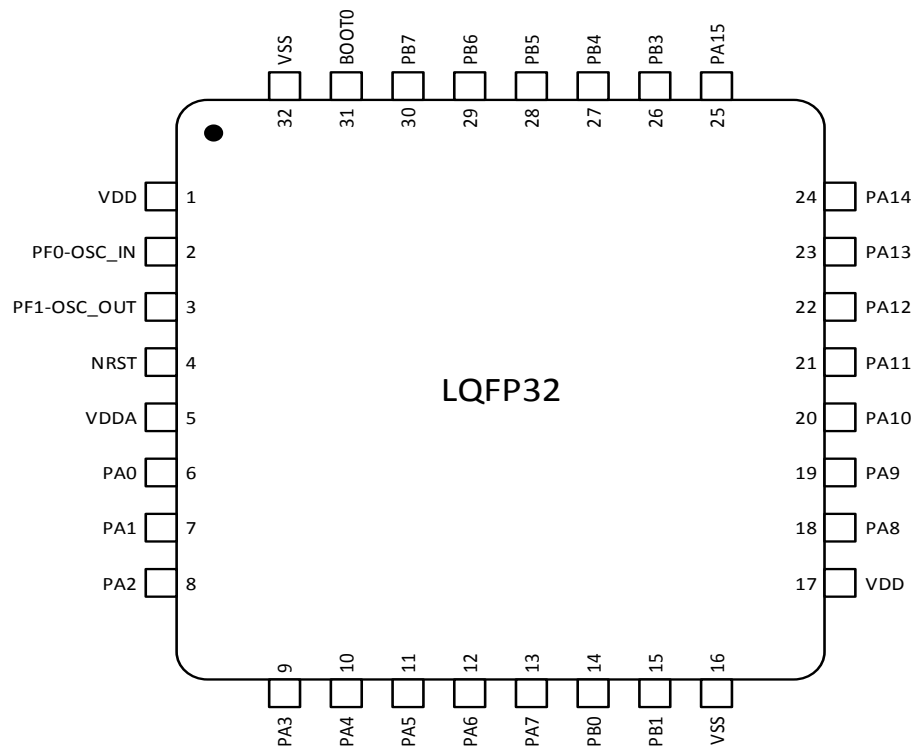
3.2 TQFP48
3.2.1 TQFP48 pinouts



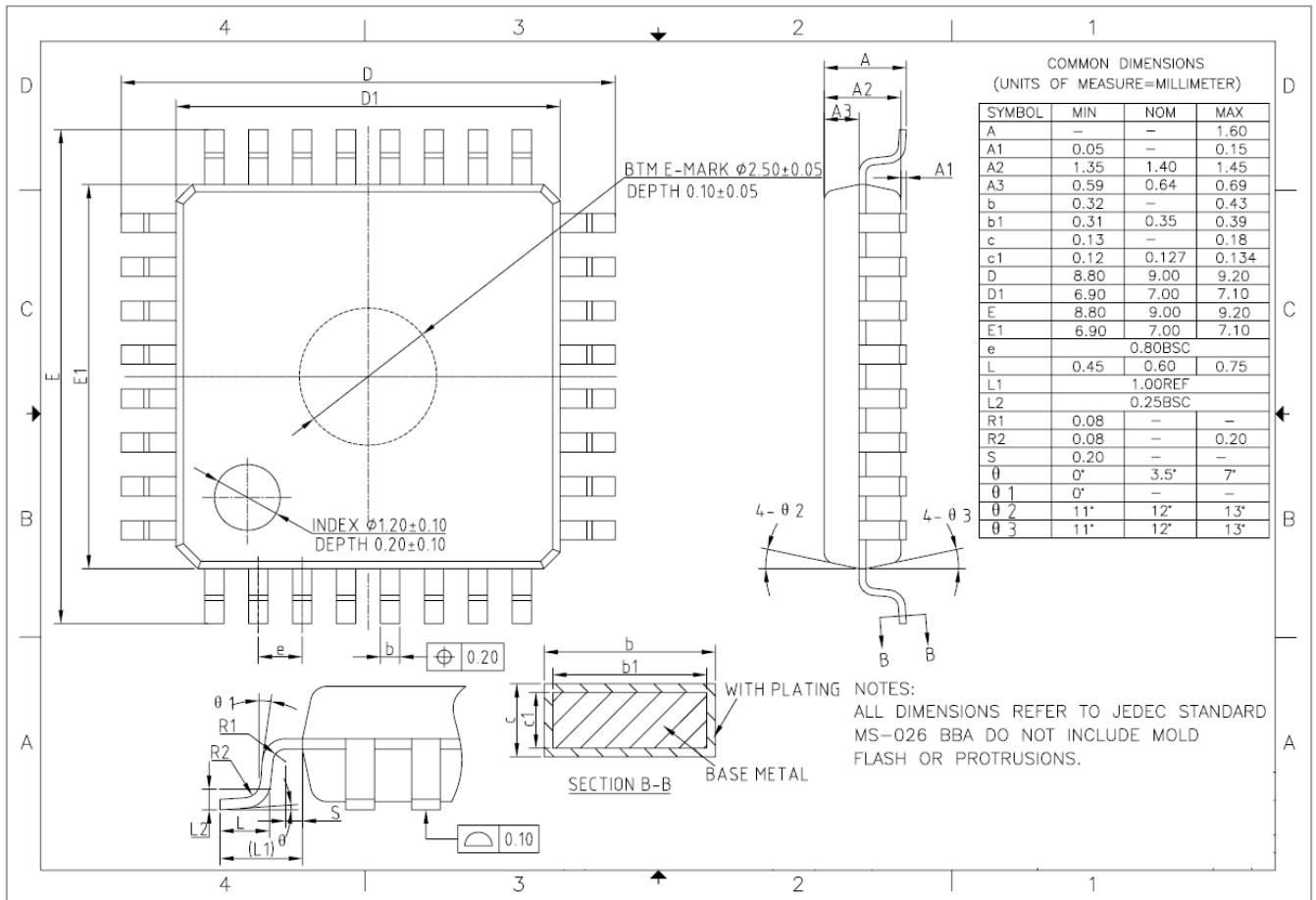
3.2.2 TQFP48 package



3.3 LQFP32
3.3.1 LQFP32 pinouts

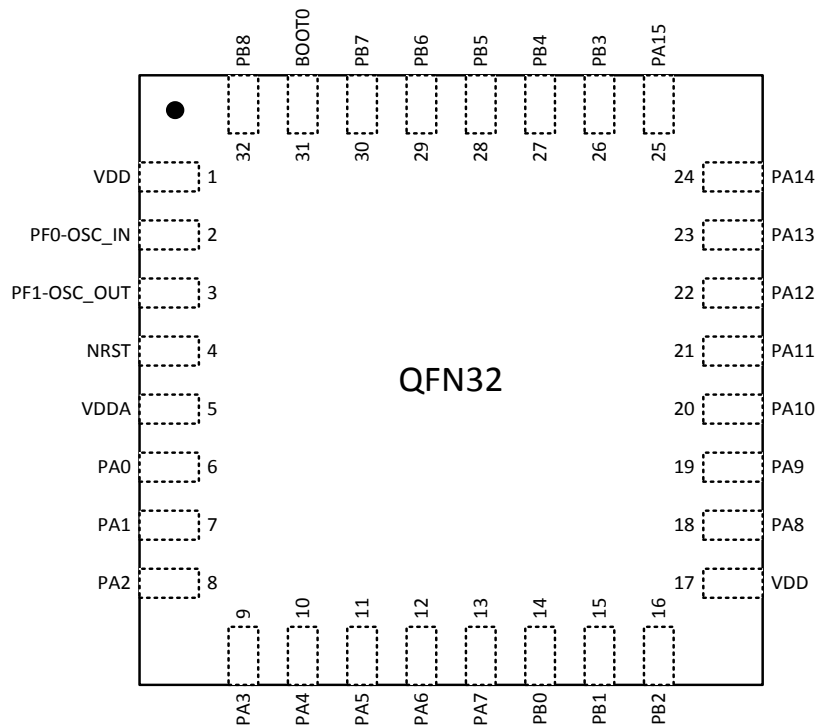


3.3.2 LQFP32 package

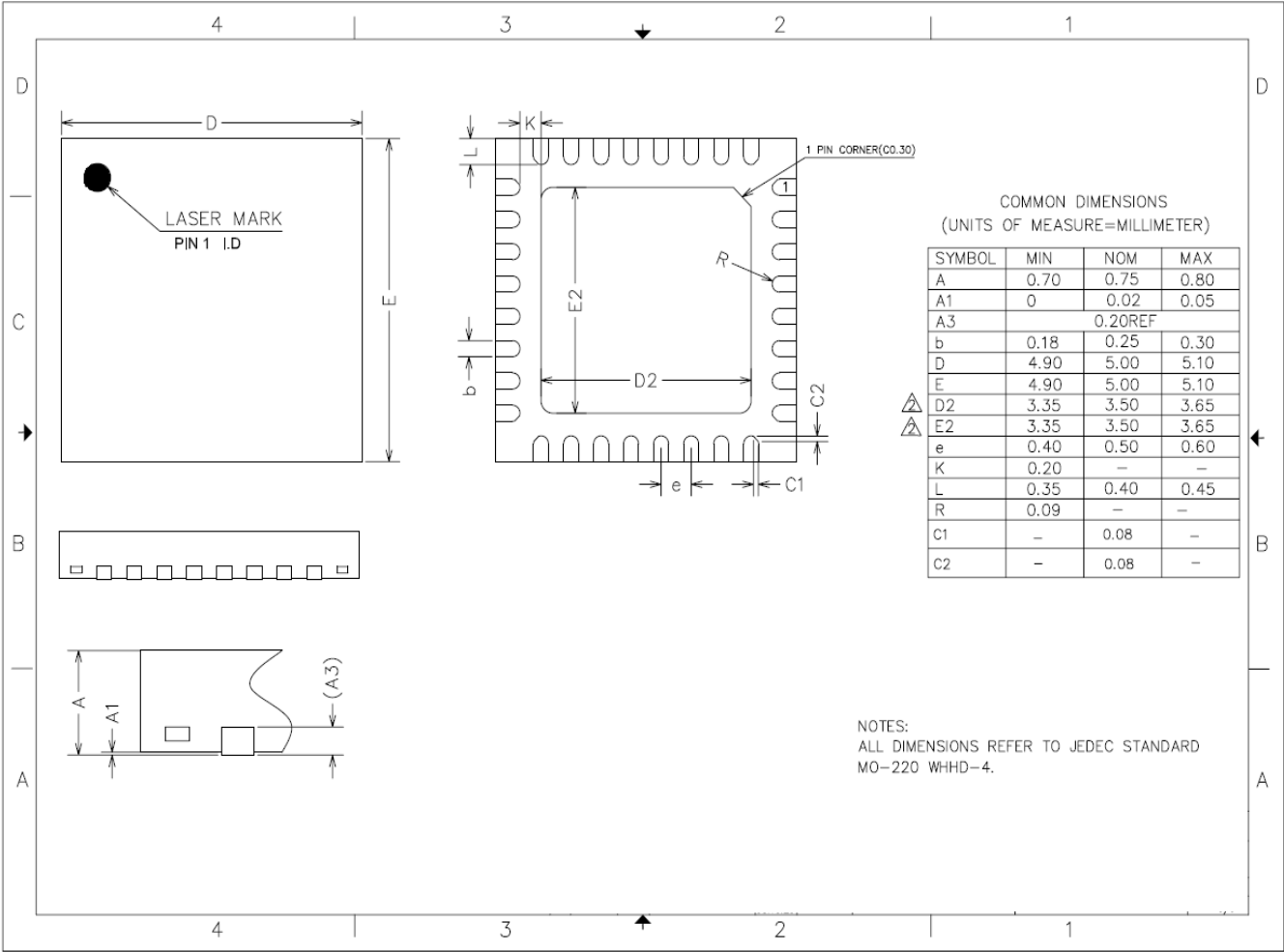


3.4 QFN32(5mx5m)

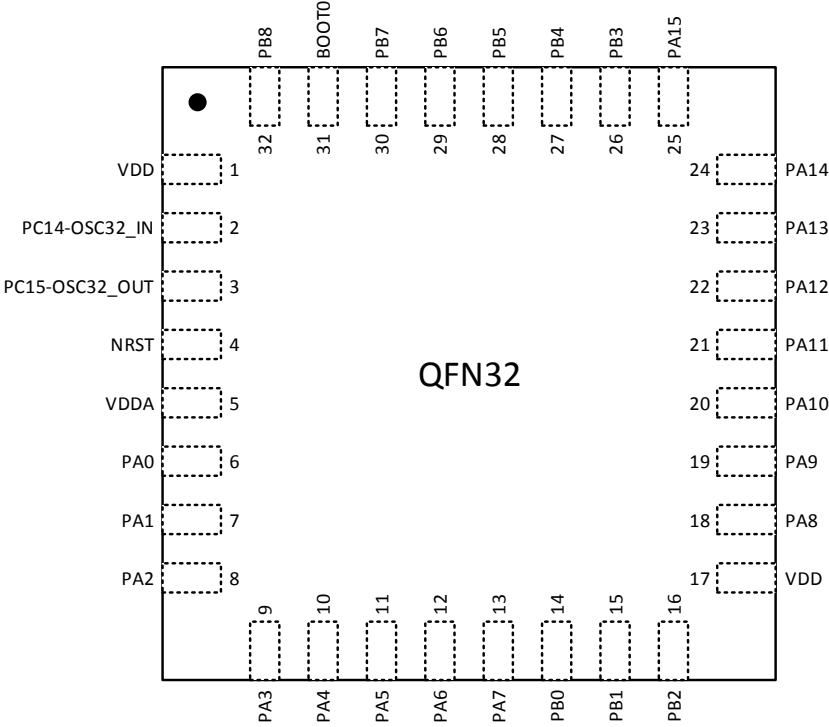
3.4.1 QFN32 (5mx5m) pinouts



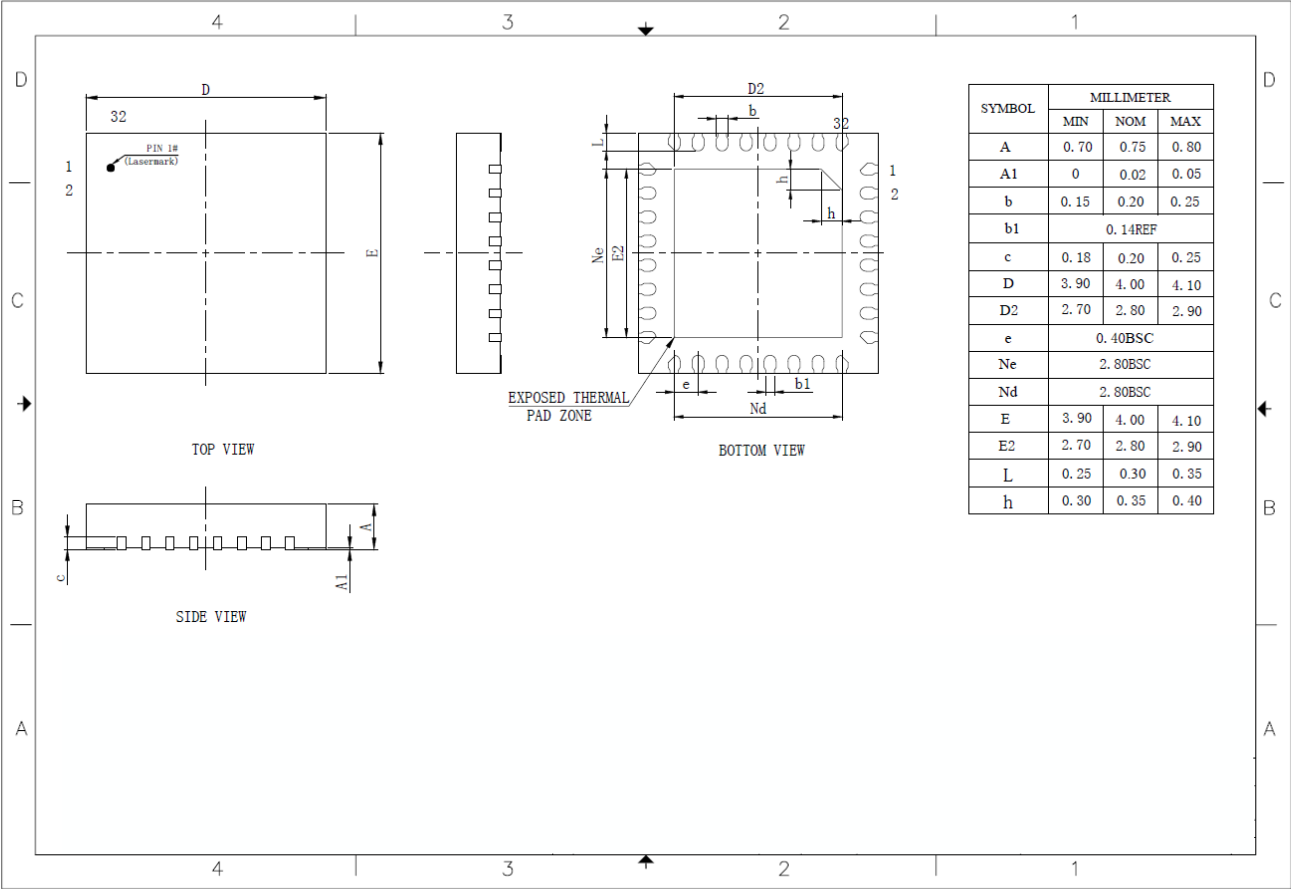
3.4.2 QFN32 (5mx5m) package



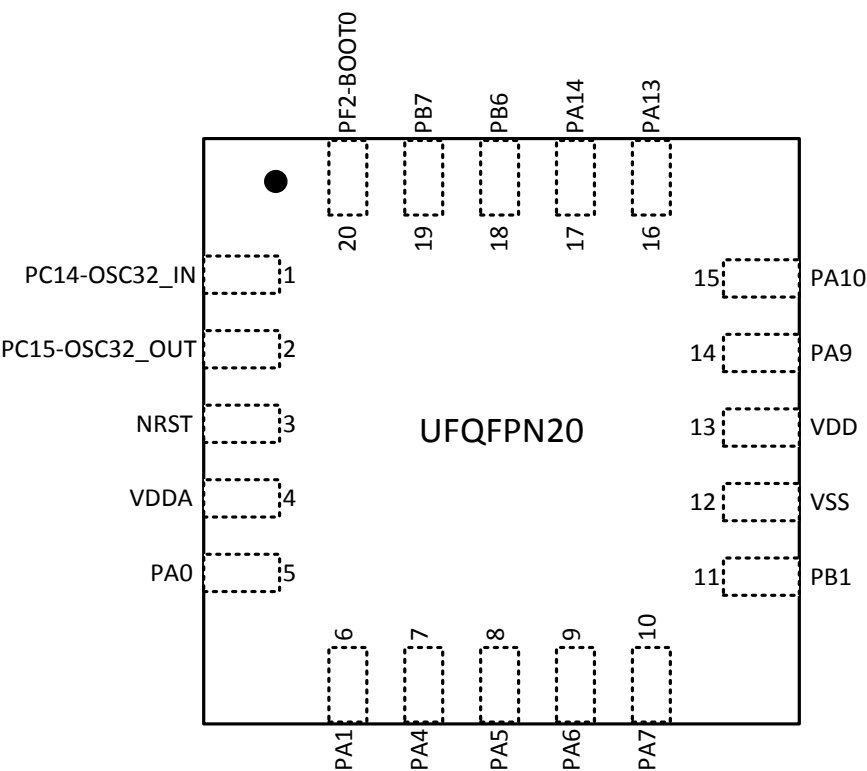
3.5 QFN32 (4mx4m)
3.5.1 QFN32 (4mx4m) pinouts



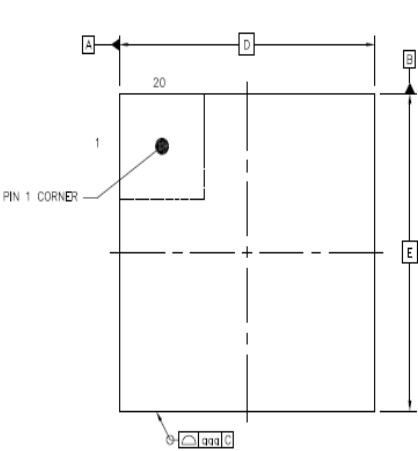
3.5.2 QFN32 (4mx4m) package



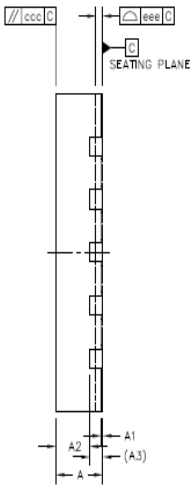
3.6 UFQFPN20
3.6.1 UFQFPN20 pinouts



3.6.2 UFQFPN20 package

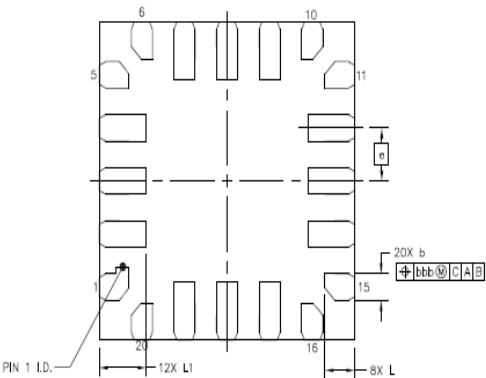


TOP VIEW



SIDE VIEW

	SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS	A	0.5	0.55	0.6
STAND OFF	A1	0	0.02	0.05
MOLD THICKNESS	A2	---	0.4	---
L/F THICKNESS	A3	0.152 REF		
LEAD WIDTH	b	0.2	0.25	0.3
BODY SIZE	X	3 BSC		
	Y	3 BSC		
LEAD PITCH	e	0.5 BSC		
LEAD LENGTH	L	0.25	0.35	0.45
	L1	0.45	0.55	0.65
PACKAGE EDGE TOLERANCE	aaa	0.1		
MOLD FLATNESS	ccc	0.1		
COPLANARITY	eee	0.08		
LEAD OFFSET	bbb	0.1		

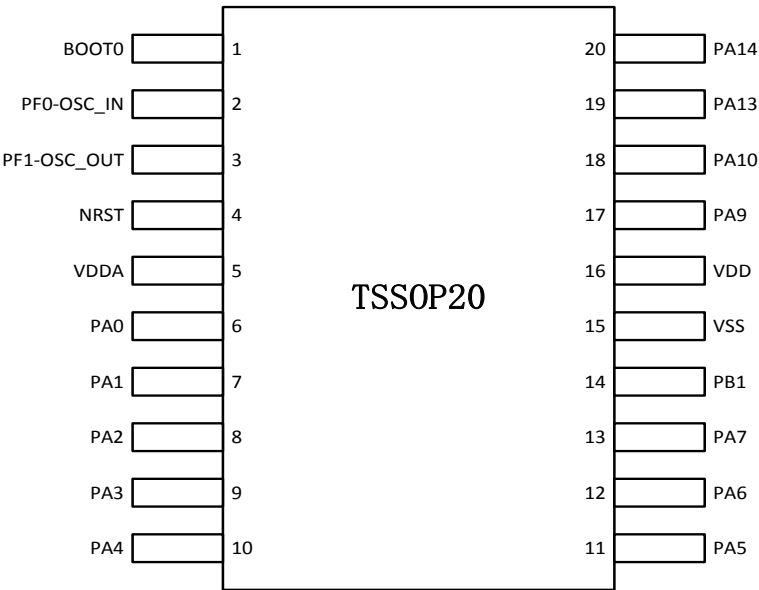


BOTTOM VIEW

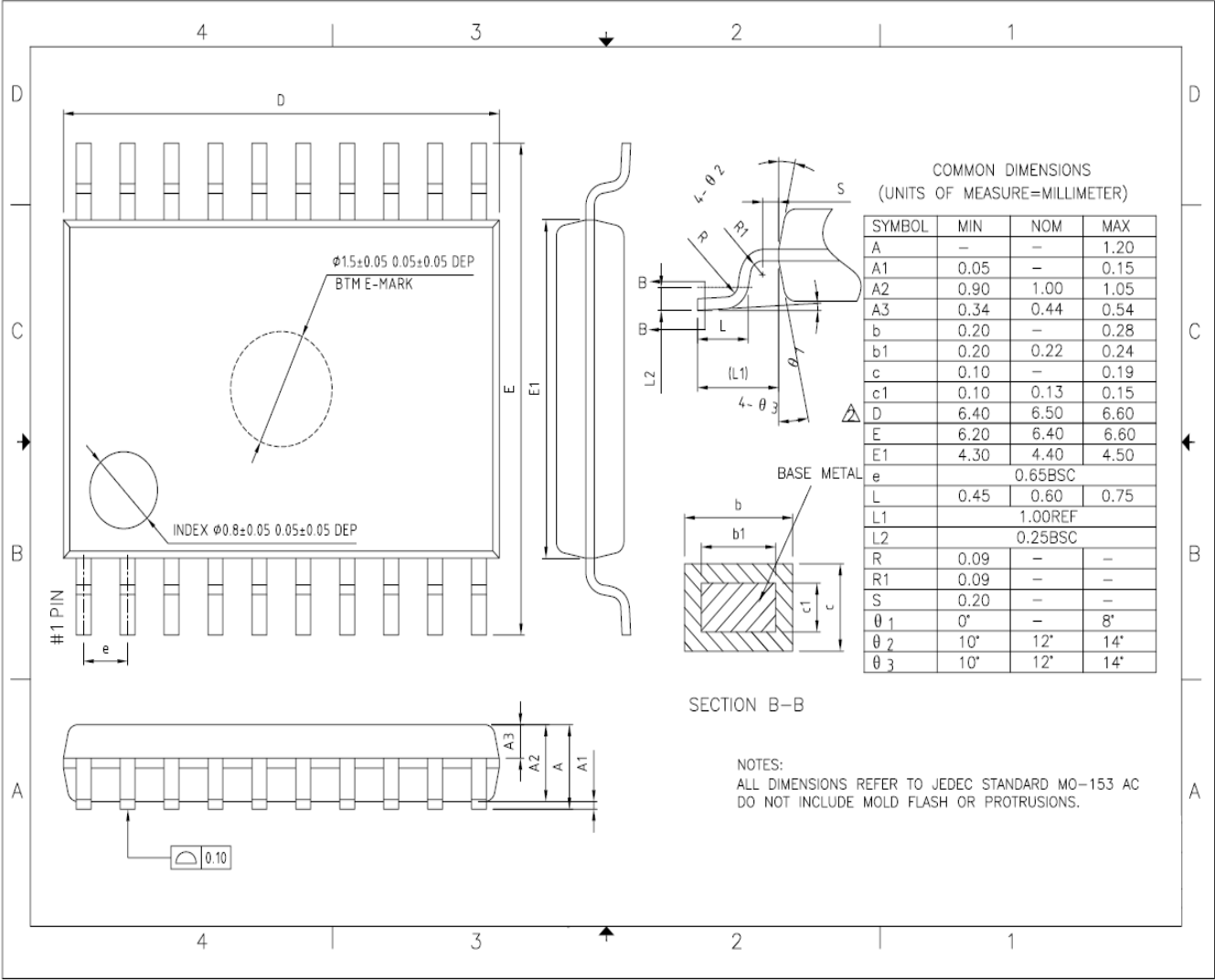
NOTES
1.REFER TO JEDEC MO-220;
2.COPLANARITY APPLIES TO LEADS, CORNER LEADS AND DIE ATTACH PAD;
3.BAN TO USE THE LEVEL 1 ENVIRONMENT-RELATED SUBSTANCES OF J-STD-020;
4.FINISH: Cu/EP • Sn8~20s

3.7 TSSOP20

3.7.1 TSSOP20 pinouts



3.7.2 TSSOP20 package



4 Revision History

Version	Date	Description
V1.0	2020.12.30	1. Initail document
V1.1	2021.08.16	1. Modified to have only 1 comparator 2. Add TQFP48 package information
V1.2	2022.3.17	1. Modify the size of retention SRAM to 8Kbyte
V1.3	2022.7.7	1. Modify the MCO to 2-way output in key feature 2. Delete reel in part number information
V1.4	2022.9.13	3. Key feature, delete programmable low level detection and reset.

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