

# Problem-1 integrated circuit company


## IC company in U.S. stocks and A-share china


### U.S. stock

I choose the company in [the list of S&P500 companies](#)


### EX of teacher - Texas Instruments

All the data comes from "[earning & annual report](#)" of TI

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- **Type:** Chip design, manufacture and sale

- **Revenue:** US\$20.03 billion(2022)

Revenue of \$20.03 billion increased \$1.68 billion, or 9.2%, due to higher revenue from Analog and, to a lesser extent, Embedded Processing. This increase benefited from higher prices and the mix of products shipped.

- **Profits:** US\$8.75 billion(2022)

Gross profit of \$13.77 billion was up \$1.40 billion, or 11.3%, primarily due to higher revenue. As a percentage of revenue, gross profit increased to 68.8% from 67.5%.

Operating profit was \$10.14 billion, or 50.6% of revenue, compared with \$8.96 billion, or 48.8% of revenue.

Net income was \$8.75 billion compared with \$7.77 billion. EPS was \$9.41 compared with \$8.26.

- **Market capitalization:** US\$130.02 billion (2023.11.2) (source:[companiesmarketcap.com](https://companiesmarketcap.com))
- **Number of employees:** 33,000(2022)

At December 31, 2022, we had about 33,000 employees worldwide. Of those, about 90% were in R&D, sales or manufacturing. Our objective for human capital management is to recruit, develop and retain the best talent possible. As a technology and manufacturing company, our success is grounded in having strong engineering talent and a reliable factory workforce. We have a promote-from-within culture and offer training and rotation programs that provide the opportunity to quickly gain experience in different areas. In 2022, our turnover rate was 12.1%.

## Its game that change the world - Nvidia

- **Type:** graphics processors and chipsets
- **Revenue:** US\$26.974 billion(2022)

### Fiscal Year 2023 Summary

	Year Ended		
	January 29, 2023	January 30, 2022	Change
(\$ in millions, except per share data)			
Revenue	\$ 26,974	\$ 26,914	— %
Gross margin	56.9 %	64.9 %	Down 8.0 pts
Operating expenses	\$ 11,132	\$ 7,434	Up 50%
Income from operations	\$ 4,224	\$ 10,041	Down 58%
Net income	\$ 4,368	\$ 9,752	Down 55%
Net income per diluted share	\$ 1.74	\$ 3.85	Down 55%

- **Profits:** US\$4368 million(2022)

### Fiscal Year 2023 Summary

	Year Ended		
	January 29, 2023	January 30, 2022	Change
(\$ in millions, except per share data)			
Revenue	\$ 26,974	\$ 26,914	— %
Gross margin	56.9 %	64.9 %	Down 8.0 pts
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Net income per diluted share	\$ 1.74	\$ 3.85	Down 55%

- **Market capitalization:** US\$1.072 trillion (2023.11.2) (source:[companiesmarketcap.com](https://companiesmarketcap.com))
- **Number of employees:** 26,196(2023)

### Human Capital Management

We believe that our employees are our greatest assets, and they play a key role in creating long-term value for our stakeholders. As of the end of fiscal year 2023, we had 26,196 employees in 35 countries, 19,532 were engaged in research and development and 6,664 were engaged in sales, marketing, operations, and administrative positions.

## Last semiconductor company on S&P500 - First Solar

- **Type:** Solar panel manufacture, solution provider and services supporting

- **Revenue:** US\$17.7 billion (2022)

We generally price and sell our solar modules on a per watt basis. As of December 31, 2022, we had entered into contracts with customers for the future sale of 61.4 GW<sub>DC</sub> of solar modules for an aggregate transaction price of \$17.7 billion, which we expect to recognize as **revenue** through 2029 as we transfer control of the modules to the

- **Profits:** not found
- **Market capitalization:** US\$15.71 billion (2023.11.2) (source:[companiesmarketcap.com](https://companiesmarketcap.com))
- **Number of employees:** 5,500

As of December 31, 2022, we had approximately 5,500 associates (our term for full and part-time employees), including approximately 4,700 in our modules business that work primarily in the United States, Malaysia, and Vietnam. The remainder of our associates are in R&D, sales and marketing, and general and administrative positions.

## Apple make chips - Apple

- **Type:** phone, pc, MR devices and some vedio content
- **Revenue:** US\$394.33 billion (2022)

The following table shows net sales by category for 2022, 2021 and 2020 (dollars in millions):

	2022	Change	2021	Change	2020
Net sales by category:					
iPhone <sup>(1)</sup>	\$ 205,489	7 %	\$ 191,973	39 %	\$ 137,781
Mac <sup>(1)</sup>	40,177	14 %	35,190	23 %	28,622
iPad <sup>(1)</sup>	29,292	(8)%	31,862	34 %	23,724
Wearables, Home and Accessories <sup>(1)(2)</sup>	41,241	7 %	38,367	25 %	30,620
Services <sup>(3)</sup>	78,129	14 %	68,425	27 %	53,768
Total net sales	<u>\$ 394,328</u>	8 %	<u>\$ 365,817</u>	33 %	<u>\$ 274,515</u>

- **Profits:** US\$399.80 billion (2022)

	Years ended		
	September 24, 2022	September 25, 2021	September 26, 2020
Net income	\$ 99,803	\$ 94,680	\$ 57,411
Other comprehensive income/(loss):			
Change in foreign currency translation, net of tax	(1,511)	501	88
Change in unrealized gains/losses on derivative instruments, net of tax:			
Change in fair value of derivative instruments	3,212	32	79
Adjustment for net (gains)/losses realized and included in net income	(1,074)	1,003	(1,264)
Total change in unrealized gains/losses on derivative instruments	2,138	1,035	(1,185)

- **Market capitalization:** US\$2.772 trillion (2023.11.2) (source:[companiesmarketcap.com](https://companiesmarketcap.com))
- **Number of employees:** 164,000

### Human Capital

The Company believes it has a talented, motivated and dedicated team, and works to create an inclusive, safe and supportive environment for all of its team members. As of September 24, 2022, the Company had approximately 164,000 full-time equivalent employees.

# A股

## 乐鑫科技

- 类型: 芯片设计，制造
- 产值: 12.71亿 CNY (2022)

单位：元 币种：人民币

主要会计数据	2022年	2021年	本期比上年同期增减(%)	2020年
营业收入	1,271,127,201.38	1,386,371,540.68	-8.31	831,286,490.38
归属于上市公司股东的净利润	97,323,102.86	198,427,707.60	-50.95	104,051,960.77
归属于上市公司股东的扣除非经常性损益的净利润	66,652,832.13	172,699,580.93	-61.41	73,851,753.65
剔除股份支付影响的归属于上市公司股东的净利润	112,049,122.01	220,215,671.51	-49.12	122,809,950.77
经营活动产生的现金流量净额	71,321,658.45	31,460,856.67	126.70	36,055,510.67
	2022年末	2021年末	本期末比上年同期末增减(%)	2020年末
归属于上市公司股东的净资产	1,826,677,535.22	1,823,017,912.65	0.20	1,641,130,356.28
总资产	2,082,796,825.49	2,129,056,142.87	-2.17	1,829,631,150.05

- 年利润: 9732万 CNY (2022)

单位：元 币种：人民币

主要会计数据	2022年	2021年	本期比上年同期增减(%)	2020年
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总资产	2,082,796,825.49	2,129,056,142.87	-2.17	1,829,631,150.05

- 市值: 83.51亿 CNY (2023.11.2) (source:[Google财经](#))
- 员工数: 578

### (一) 员工情况

母公司在职员工的数量	338
主要子公司在职员工的数量	240
在职员工的数量合计	578
母公司及主要子公司需承担费用的离退休职工人数	0
专业构成	
专业构成类别	专业构成人数
生产人员	13
销售人员	53
技术人员	440
财务人员	16
行政人员	56
合计	578
教育程度	
教育程度类别	数量（人）
博士	11
硕士	306
本科	241
专科	5
高中	13
初中	2
合计	578

## 港交所

### 中芯国际

- **类型:** 集成电路代加工，芯片制造
- **产值:** 495.16亿 CNY (2022)

单位：千元 币种：人民币

主要会计数据	2022年	2021年	本期比上年同期增减(%)	2020年
营业收入	49,516,084	35,630,634	39.0	27,470,709
归属于上市公司股东的净利润	12,133,079	10,733,098	13.0	4,332,270
归属于上市公司股东的扣除非经常性损益的净利润	9,764,381	5,325,423	83.4	1,696,902
经营活动产生的现金流量净额	36,591,209	20,844,994	75.5	13,174,290
息税折旧及摊销前利润	30,997,574	24,403,395	27.0	14,124,599

- 年利润: 121.33亿 CNY (2022)

单位：千元 币种：人民币

主要会计数据	2022年	2021年	本期比上年同 期增减 (%)	2020年
营业收入	49, 516, 084	35, 630, 634	39. 0	27, 470, 709
归属于上市公司股东的净利润	12, 133, 079	10, 733, 098	13. 0	4, 332, 270
归属于上市公司股东的扣除非 经常性损益的净利润	9, 764, 381	5, 325, 423	83. 4	1, 696, 902
经营活动产生的现金流量净额	36, 591, 209	20, 844, 994	75. 5	13, 174, 290
息税折旧及摊销前利润	30, 997, 574	24, 403, 395	27. 0	14, 124, 599

- 市值: 2,645.27亿 HKD (2023.11.2) (source:Google财经)
- 员工数: 21619

十四、报告期末员工情况

(一) 员工情况

母公司在职员工的数量	2
子公司在职员工的数量	21, 617
在职员工的数量合计	21, 619
母公司及子公司需承担费用的离退休职工人数	9
专业构成	
专业构成类别	专业构成人数
生产人员	16, 903
销售人员	243
研发人员	2, 326
行政人员	2, 147
合计	21, 619
教育程度	
教育程度类别	数量（人）
博士	557
硕士	4, 543
本科	8, 101
大专及以下	8, 418
合计	21, 619
性别比例	
性别	比例%
男	63. 6
女	36. 4

What hell is Synopsys, Cadence and Mentor Graphics

Synopsys

Source: Synopsys Posts Financial Results for Third Quarter Fiscal Year 2023

Q3 2023

Q2 2023

Q1 2023

Q4 2022

## Q3 2023 Report

### Synopsys Posts Financial Results for Third Quarter Fiscal Year 2023

*Announces Sassine Ghazi to Assume President and CEO Role Effective Jan. 1, 2024*


#### Q3 FY 2023 Summary

- Record quarterly revenue of \$1.487 billion, up 19% year over year.
- GAAP earnings per diluted share of \$2.17; non-GAAP earnings per diluted share of \$2.88, exceeded high end of guidance.
- Raising full-year 2023 revenue, non-GAAP operating margin improvement, and earnings guidance; committed to long-term model of double-digit annual revenue growth.

SUNNYVALE, Calif., Aug. 16, 2023 /PRNewswire/ -- Synopsys, Inc. (Nasdaq: SNPS) today reported results for its third quarter of fiscal year 2023. Revenue for the third quarter of fiscal year 2023 was \$1.487 billion, compared to \$1.248 billion for the third quarter of fiscal year 2022. Also today, the company announced that its Board of Directors has


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## Related Information

[SEC Filing >](#)

- Type:** EDA, silicon design and verification, silicon ip and software security
- CN name:** 新思科技
- 2023 Q3 Revenue:** US\$1567 million (2023Q3)

### Fourth Quarter and Fiscal Year 2023 Financial Targets <sup>(1)</sup>

*(in millions except per share amounts)*

	Range for Three Months Ending		Range for Fiscal Year Ending	
	October 31, 2023		October 31, 2023	
	Low	High	Low	High
Revenue	\$ 1,567	\$ 1,597	\$ 5,810	\$ 5,840
GAAP Expenses	\$ 1,184	\$ 1,204	\$ 4,544	\$ 4,564
Non-GAAP Expenses	\$ 1,005	\$ 1,015	\$ 3,780	\$ 3,790
Non-GAAP Other Income (Expense)	\$ 1	\$ 3	\$ 10	\$ 12
Non-GAAP Tax Rate	16 %	16 %	16 %	16 %
Outstanding Shares (fully diluted)	155	157	155	157
GAAP EPS	\$ 2.17	\$ 2.28	\$ 7.85	\$ 7.96
Non-GAAP EPS	\$ 3.01	\$ 3.06	\$ 11.04	\$ 11.09
Operating Cash Flow	~ \$1,650			

- 2023 Q3 Profits:** US\$336.3 million (2023Q3)

#### GAAP Results

On a generally accepted accounting principles (GAAP) basis, **net income** for the third quarter of fiscal year 2023 was \$336.3 million, or \$2.17 per diluted share, compared to \$222.6 million, or \$1.43 per diluted share, for the third quarter of fiscal year 2022.

#### Non-GAAP Results

On a non-GAAP basis, **net income** for the third quarter of fiscal year 2023 was \$445.9 million, or \$2.88 per diluted share, compared to non-GAAP **net income** of \$327.4 million, or \$2.10 per diluted share, for the third quarter of fiscal year 2022.

For a reconciliation of **net income**, earnings per diluted share and other measures on a GAAP and non-GAAP basis, see "GAAP to Non-GAAP Reconciliation" in the accompanying tables below.



**cadence** Products Solutions Support Company

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## Cadence Reports Third Quarter 2023 Financial Results

23 Oct 2023

Click here for the [Q3 2023 Financial Schedules](#).

SAN JOSE, Calif.— Cadence Design Systems, Inc. (Nasdaq: CDNS) today announced results for the third quarter of 2023.

Cadence reported third quarter 2023 revenue of \$1.023 billion, compared to revenue of \$903 million for the same period in 2022. On a GAAP basis, Cadence achieved operating margin of 29 percent and recognized net income of \$254 million, or \$0.93 per share on a diluted basis, in the third quarter of 2023, compared to operating margin of 29 percent

**Media Contacts**

For more information, please contact:

**Cadence Newsroom**

408.944.7039  
[newsroom@cadence.com](mailto:newsroom@cadence.com)

- **Type:** EDA, software for designing IC, SoC, PCB
- **CN name:** 益华电脑股份有限公司,或称楷登电子
- **2023 Q3 Revenue:** US\$1.023 billion (2023Q3)

Cadence reported third quarter 2023 **revenue** of **\$1.023 billion**, compared to **revenue** of \$903 million for the same period in 2022. On a GAAP basis, Cadence achieved operating margin of 29 percent and recognized net income of \$254 million, or \$0.93 per share on a diluted basis, in the third quarter of 2023, compared to operating margin of 29 percent and net income of \$186 million, or \$0.68 per share on a diluted basis, for the same period in 2022.

- **2023 Q3 Profits:** US\$254 million (2023Q3)

Cadence reported third quarter 2023 revenue of \$1.023 billion, compared to revenue of \$903 million for the same period in 2022. On a GAAP basis, Cadence achieved operating margin of 29 percent and recognized **net income** of **\$254 million**, or \$0.93 per share on a diluted basis, in the third quarter of 2023, compared to operating margin of 29 percent and **net income** of \$186 million, or \$0.68 per share on a diluted basis, for the same period in 2022.

## Source: SEC FORM 10-K 2017 ANNUAL REPORT Archives

☒

None

Quarter ended	April 30	July 31	October 31	January 31
<b>Fiscal Year 2017</b>				
Total revenues	\$ 227,639	\$ 254,344	\$ 322,516	\$ 477,968
Gross profit	\$ 184,774	\$ 204,714	\$ 271,326	\$ 427,425
Operating income (loss)	\$ (12,065)	\$ 6,250	\$ 56,314	\$ 152,582
Net income (loss) attributable to Mentor Graphics shareholders	\$ (13,436)	\$ 3,437	\$ 41,762	\$ 123,103
Net income (loss) per share, basic	\$ (0.12)	\$ 0.03	\$ 0.38	\$ 1.12
Net income (loss) per share, diluted	\$ (0.12)	\$ 0.03	\$ 0.37	\$ 1.05

# Probelm-2 shell programing

```
# homework1 shell problem @drinktoomuchsax
disMenu(){
echo ""
echo "1. List all files in the present working directory"
echo "2. Display today's date and time"
echo "3. Display whether a file is a 'simple' file or a 'directory'"
echo "4. Create a backup for a file"
echo "5. Start an ftp session"
echo "6. Start your LED control program"
echo "7. Exit"
echo ""
}
select choice in
    list date check backup ftp startLED quit
do
    case $choice in
        list) ls
            disMenu;;
        date) date;;
        check) echo "Enter the file path: "
            read file_path
            if [ -f $file_path ]; then
                echo "The file is a simple file."
            elif [ -d $file_path ]; then
                echo "The file is a directory."
            else
                echo "The file does not exist."
            fi;;
        backup) read -p "Enter the file path: " filepath
            cp $file_path $file_path.bak;;
        ftp)echo "Enter domain name or IP address "
            read IP
            ftp $IP;;
        startLED) ./led_control_program;;
        quit) exit;;
        *) echo "Invalid choice. Try again.>";;
    esac
done
```

More on demo vedio

# Problem-3 hello makefile

More on demo vedio

```
# Make all: run all three targets
all: sort_file find_log delete_lock_file

# Make sort_file: list the file/directories with respect to the file size
sort_file:
    ls -S

# Make find_log: find the log file in your home directory (you may create some dummies)
find_log:
    find ~/ -name "*.log"

# Make delete_lock_file: find the lock files in your home directory and then delete the
delete_lock_file:
    find ~/ -name "*.lock" -delete
```