Company Overview
M31 Name Story

M31 known as the Andromeda Galaxy is approximately 2.25 million light-years away from the earth.
又名仙女座星系，距離地球兩百二十五萬光年

It is the most distant “DEEP-SKY OBJECT” that is visible from the earth through naked eyes.
是在地球上肉眼可見最遠的 “深空天體”

We expect that every IP developed by M31 Technology
因此我們期許所開發的每一個 IP

to be just like the M31 galaxy inspiring unlimited imagination and bringing us a brighter future.
就像M31星系一般，充滿了無限的想像與未來
Business Model

Foundries

Provide Fundamental IP for customer to use

Fabless

1. License fee
2. Royalty

IP license
Hsiao-Ping Lin is the Chairman and CEO of M31 Technology Corporation. He served as the President of Faraday Technology Corporation from December 1996 to March 2011.

Mr. Lin received his Bachelor of Science degree in Electrical Engineering from the National Taiwan University in 1981 and his Master of Science degree in Electrical Engineering from the University of California at Santa Barbara in 1984.

Prior to his serving as the Vice President of Research & Development at Faraday in 1993, he worked at United Microelectronics Corporation (UMC) and Cadence Taiwan (ECAD).

Over the years, Mr. Lin has received many honors, including: National Award for Best Young Engineer, R.O.C. (1992), National Top Ten Distinguished Engineer Award, R.O.C. (1998) and the Award for Industrial Technology Advancement, R.O.C. (2005).
Willis Shih is the Vice President of Fundamental IP development division of M31 Technology Corporation.
Prior to joining M31, Mr. Shih held senior positions in semiconductor companies both in the U.S. and Asia region. He severed as senior managers at Faraday Technology USA and Chingis Technology. He also held senior engineering positions at Virtual Silicon and Faraday Technology Corp..
Mr. Shih received his Bachelor and Master of Science degrees in Electrical Engineering from National Taiwan University. He holds many low power and memory patents.

Scott Chang is the Vice President of Functional IP development division at M31 Technology Corporation.
Prior to joining M31, Mr. Chang served at Faraday Technology Corp. as the designer and manager of high-speed interface IP development department.
Mr. Chang received his Bachelor and Master of Science degree in Electrical Engineering from National Chiao-Tung University.

Jerry Liu is the Chief Financial Officer at M31 Technology Corporation.
Prior to joining M31, Mr. Liu worked as an auditor at KPMG and served as an internal auditor at Faraday Technology Corp..
Mr. Liu received his Bachelor and Master of Accounting degree from National Taiwan University and passed the CPA exam of R.O.C.
Introduction

“Be the most trustworthy IP company”

- World-class Silicon Intellectual Property (IP) provider
- Intimate collaboration with semiconductor leaders
- Targeting mature/advanced technologies
- Leveraging Asian semiconductor supply chain resources
- An "IP boutique" providing top-shelf products and industrial services
Milestones

Founded in Taiwan

2011
- Concentrate on IP Development Quality System Setup
- Partnership with multiple Foundries
- Establish Global Reach (US/China Branch)

2012-2014
- Dig into ULP technique for IoT
- Develop 16nm to 180nm
- Collaboration with worldwide top 10 Fabless

2015-2016

2017
- Build ISO26262 System
- Win 1st Automotive Customer
- Listed at emerging stock market (TPE:6643)

Enter AI & Automotive Area

2018
Awards - TSMC, SMIC & EETimes

2014 Hot Startups to Watch in EE Times Silicon 60 Report

2013 Emerging IP Provider Award by TSMC

2014 Customers’ Choice Award from TSMC OIP Forum

2014 Best IP Partner Award by SMIC

2015 Best IP Partner Award by SMIC

2016 & 2018 Specialty IP Partner Award by TSMC
Global Market Trend Analysis
Global Market Trend Analysis

Global Semiconductor IP Market ($ bn)

2017-2022
CAGR 9.79%

Data Source: Global Semiconductor IP Market 2018-2022, TechNavio (Infiniti Research Ltd.)
Market Share by Region

2017 Market Share by Region ($ bn)
- North America: 1.77, 40%
- APAC: 0.58, 13%
- Europe: 2.1, 47%

2017-2022 Incremental growth
- $2.65 bn

Data Source: Global Semiconductor IP Market 2018-2022, TechNavio (Infiniti Research Ltd.)

2022 Market Share by Region ($ bn)
- North America: 3.06, 43%
- APAC: 3.15, 44%
- Europe: 0.89, 13%
Nearly 50% of the Incremental Growth will originate from APAC

Contribution to Growth by Region (2017-2022)

- North America: 11.7%
- APAC: 48.68%
- Europe: 39.62%

Data Source: Global Semiconductor IP Market 2018-2022, TechNavio (Infiniti Research Ltd.)
Market Share by IP Type

2017-2022 IP CAGR

- Processor IP: 5.92%
- Digital IP: 10.51%
- Physical IP: 10.47%

2017 IP Market Share (%)

<table>
<thead>
<tr>
<th>Type</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor IP</td>
<td>51.91%</td>
</tr>
<tr>
<td>Physical IP</td>
<td>31.91%</td>
</tr>
<tr>
<td>Digital IP</td>
<td>16.18%</td>
</tr>
</tbody>
</table>

2022 IP Market Share (%)

<table>
<thead>
<tr>
<th>Type</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor IP</td>
<td>53.52%</td>
</tr>
<tr>
<td>Physical IP</td>
<td>32.96%</td>
</tr>
<tr>
<td>Digital IP</td>
<td>13.52%</td>
</tr>
</tbody>
</table>

Physical IP has the highest growth rate

Data Source: Global Semiconductor IP Market 2018-2022, TechNavio (Infiniti Research Ltd.)
Revenue
Revenue (Fabless vs Foundry)

<table>
<thead>
<tr>
<th>Year</th>
<th>Fabless</th>
<th>Foundry</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>6,841,287</td>
<td>0</td>
<td>6,841,287</td>
</tr>
<tr>
<td>2015</td>
<td>8,758,493</td>
<td>0</td>
<td>8,758,493</td>
</tr>
<tr>
<td>2016</td>
<td>15,355,494</td>
<td>0</td>
<td>15,355,494</td>
</tr>
<tr>
<td>2017</td>
<td>20,821,525</td>
<td>0</td>
<td>20,821,525</td>
</tr>
<tr>
<td>2018</td>
<td>21,967,323</td>
<td>0</td>
<td>21,967,323</td>
</tr>
</tbody>
</table>

Revenue (US $)
M31 2015~2018 License (USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>License (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>6,913,156</td>
</tr>
<tr>
<td>2016</td>
<td>13,481,935</td>
</tr>
<tr>
<td>2017</td>
<td>18,690,997</td>
</tr>
</tbody>
</table>
M31 2015~2018 Royalty (USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Royalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,845,337</td>
</tr>
<tr>
<td>2016</td>
<td>1,873,560</td>
</tr>
<tr>
<td>2017</td>
<td>2,130,528</td>
</tr>
<tr>
<td>2018 Jan.~Nov.</td>
<td>2,560,664</td>
</tr>
</tbody>
</table>
M31 2015~2018 Revenue by Product Type (USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Functional IP</th>
<th>Fundamental IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>3,754,576</td>
<td>5,003,917</td>
</tr>
<tr>
<td>2016</td>
<td>4,752,478</td>
<td>10,603,017</td>
</tr>
<tr>
<td>2017</td>
<td>7,628,848</td>
<td>13,192,678</td>
</tr>
<tr>
<td>2018 Jan.~Nov.</td>
<td>8,509,543</td>
<td>13,457,780</td>
</tr>
</tbody>
</table>

Legend:
- Functional IP
- Fundamental IP
M31 2015~2018 Revenue by Customer Type (USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Fabless</th>
<th>Foundry</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>3,601,663</td>
<td>5,156,831</td>
<td>8,758,494</td>
</tr>
<tr>
<td>2016</td>
<td>6,860,299</td>
<td>8,495,195</td>
<td>15,355,494</td>
</tr>
<tr>
<td>2017</td>
<td>9,685,605</td>
<td>11,135,921</td>
<td>20,821,526</td>
</tr>
<tr>
<td>2018</td>
<td>9,825,386</td>
<td>12,141,937</td>
<td>21,967,323</td>
</tr>
</tbody>
</table>

Fabless: 36%, 41%, 45%, 47%
Foundry: 64%, 59%, 55%, 53%
Revenue (Regional Distribution) (KNTD)

2017 Revenue

- CHN: 166,128 (26%)
- Euro-Asia: 183,341 (29%)
- TWN: 242,447 (38%)
- USA: 41,600 (7%)

2018 Jan.-Nov. Revenue

- CHN: 200,038 (30%)
- Euro-Asia: 255,239 (38%)
- TWN: 179,347 (27%)
- USA: 30,406 (5%)
2017 vs 2018 Monthly Revenue Comparison

665,029 vs 527,802 (2018 vs 2017) Accumulate KNTD
126.00% vs 100.00% (2018 vs 2017)
IP Plans
# M31 IP Roadmap (I)

<table>
<thead>
<tr>
<th>IP Category</th>
<th>Proven Process Node</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB3.1 (Type-C)</td>
<td>16FFC/ 28HPC+</td>
<td>N7+</td>
<td></td>
</tr>
<tr>
<td>USB3.0</td>
<td>28HPC+/ 28HPC/ 40LP/ 55LP/ 65GP/ 110G</td>
<td></td>
<td>22ULP</td>
</tr>
<tr>
<td>USB2.0</td>
<td>12FFC/ 16FFC/ 28HPC+/ 28HPC/ 40LP/ 40ULP/ 55LP/ 55EF/ 55ULP/ 110G</td>
<td>N7+</td>
<td></td>
</tr>
<tr>
<td>BCK USB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCK USB3.0</td>
<td>40LP/ 55LP/ 110G</td>
<td></td>
<td>By Customer request</td>
</tr>
<tr>
<td>BCK USB2.0</td>
<td>40LP/ 40ULP/ 55LP/ 110G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCK USB1.1</td>
<td>40LP/ 40ULP/ 55LP/ 55ULP</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Displayport</strong></td>
<td>DP TX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCIe Sata</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCIe4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCIe3.0</td>
<td>28HPC+/ 40LP</td>
<td></td>
<td>22ULP</td>
</tr>
<tr>
<td>PCIe2.0</td>
<td>16FFC/ 28HPC+/ 40LP/ 55LP</td>
<td>N7+</td>
<td></td>
</tr>
<tr>
<td>SATA3.0</td>
<td>28HPC+/ 40LP/ 55LP</td>
<td></td>
<td>By Customer request</td>
</tr>
<tr>
<td>MIPI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-PHY v4.0</td>
<td></td>
<td></td>
<td>By Customer request</td>
</tr>
<tr>
<td>M-PHY v3.0</td>
<td>16FFC/ 28HPC+/ 40LP/ 55LP</td>
<td>N7+</td>
<td></td>
</tr>
<tr>
<td>D-PHY v1.2/v1.1</td>
<td>28HPC+/ 40LP/ 40ULP/ 55LP</td>
<td></td>
<td>16FFC</td>
</tr>
<tr>
<td>C/D-PHY Combo (2.5G)</td>
<td>28HPC+</td>
<td></td>
<td>22ULP/ 22ULL</td>
</tr>
<tr>
<td>Analog IP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLL, LDO, OSC, ADC, DAC</td>
<td></td>
<td>22ULL</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16FFC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>40ULP</td>
</tr>
</tbody>
</table>
## M31 IP Roadmap (Ⅱ)

<table>
<thead>
<tr>
<th>IP Category</th>
<th>Proven Process Node</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STD Cell</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7T(6T)</td>
<td>28nm/ 40nm/ 55nm/ 90nm/ 110nm/ 130nm/ 150nm/ 180nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>9T</td>
<td>28nm/ 40nm/ 55nm/</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>12T</td>
<td>16nm/ 28nm/ 40nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>TGL</td>
<td>28nm/ 40nm/ 55nm/ 130nm/ 150nm/ 180nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td><strong>SRAM Compiler</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>28nm/ 40nm/ 55nm/ 90nm/ 110nm/ 130nm/ 150nm/ 180nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>DP</td>
<td>28nm/ 40nm/ 55nm/</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>1PRF</td>
<td>28nm/ 40nm/ 55nm/</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>2PRF</td>
<td>28nm/ 40nm/ 55nm/ 110nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>ROM</td>
<td>28nm/ 40nm/ 55nm/ 90nm/ 110nm/ 130nm/ 150nm/ 180nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td><strong>IO</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPIO</td>
<td>28nm/ 40nm/ 55nm/ 180nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>ONFi</td>
<td>28nm/ 40nm</td>
<td>16FFC</td>
<td>N7+</td>
</tr>
<tr>
<td>SD IO</td>
<td>28nm</td>
<td>28HPC+</td>
<td>N7+</td>
</tr>
<tr>
<td>eMMC IO</td>
<td>28nm</td>
<td>28HPC+</td>
<td>N7+</td>
</tr>
</tbody>
</table>
# IoT CAGR (2017-2021)

## IoT Semiconductor Revenue 2017-2021

(Million of Dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Total</td>
<td>17,590</td>
<td>21,927</td>
<td>27,553</td>
<td>34,488</td>
<td>42,668</td>
<td>28%</td>
</tr>
</tbody>
</table>
AI CAGR (2017-2021)

AI-Related Semiconductor Revenue
2017-2021 (Million of Dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>CAGR 2017-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Total</td>
<td>1,600</td>
<td>2,200</td>
<td>4,000</td>
<td>6,000</td>
<td>8,800</td>
<td>50%</td>
</tr>
</tbody>
</table>
IoT/ Automotive/ AI Comparison

IoT vs. Automotive vs. AI Revenue 2017-2021 (Million of Dollars)

- IoT
- Automotive
- AI

Year: 2017, 2018, 2019, 2020, 2021

Revenues:
- IoT: 2017 - 30,000, 2018 - 35,000, 2019 - 40,000, 2020 - 45,000, 2021 - 50,000
- Automotive: 2017 - 40,000, 2018 - 45,000, 2019 - 50,000, 2020 - 55,000, 2021 - 60,000
- AI: 2018 - 10,000, 2019 - 15,000, 2020 - 20,000, 2021 - 25,000
M31 IP for IoT Applications

M31 starts to develop the ultra low power platform since 2015. M31 works with worldwide leading foundries to develop the low power series IP to fulfill the customer’s need. Until 2018, numerous customers use M31 IP in different filed like NB-IOT, low power wire-less chip and smart home products.

<table>
<thead>
<tr>
<th>M31 IP</th>
<th>IP Readiness</th>
<th>Process Roadmap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Power Platform/Integration Kit</td>
<td>Ready</td>
<td>55nm → 40nm → 22nm</td>
</tr>
<tr>
<td>Low Power SRAM</td>
<td>Ready</td>
<td>55nm → 40nm → 28nm → 22nm</td>
</tr>
<tr>
<td>BCK USB PHY IP</td>
<td>Ready</td>
<td>55nm → 40nm → 22nm</td>
</tr>
<tr>
<td>MIPI D-PHY IP</td>
<td>Ready</td>
<td>55nm → 40nm → 28nm → 22nm</td>
</tr>
<tr>
<td>Analog IP sets</td>
<td>Coming soon</td>
<td>40nm → 28nm → 22nm</td>
</tr>
</tbody>
</table>
M31 received the ISO26262 certification for the development process in April 2018, and the MIPI M-PHY received the ISO26262 ASIL-B certification in May. In addition, the IP is also aligned with the AEC-Q100 Grade 1 certification conditions.

### M31 IP Certification Plans (ISO26262)

<table>
<thead>
<tr>
<th>M31 IP</th>
<th>ISO26262 ASIL-B</th>
<th>AEC-Q100 Grade1</th>
<th>Process Roadmap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Compiler</td>
<td>2019Q1</td>
<td>✓</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>GPIO</td>
<td>2019Q2</td>
<td>✓</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>MIPI D-PHY</td>
<td>2019Q2</td>
<td>✓</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>PCIe4.0 PHY</td>
<td>2019Q3</td>
<td>✓</td>
<td>16nm → 7nm</td>
</tr>
<tr>
<td>USB3.1 PHY</td>
<td>2019Q4</td>
<td>✓</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>USB2.0 PHY</td>
<td>2019Q4</td>
<td>✓</td>
<td>28nm → 16nm → 7nm</td>
</tr>
</tbody>
</table>
M31 IP for AI Applications

AI is in the limelight from 2018. More and more customers focus on this fields and adopt M31 IP to optimize their performance. Like the face recognition, deep learning, autonomous car and data processing in social media. AI is everywhere now.

<table>
<thead>
<tr>
<th>M31 IP</th>
<th>IP Readiness</th>
<th>Process Roadmap</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI SRAM</td>
<td>Coming soon</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>Multiplier for AI</td>
<td>Ready</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>MIPI D-PHY</td>
<td>Ready</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>PCIe4.0 PHY</td>
<td>Coming soon</td>
<td>16nm → 7nm</td>
</tr>
<tr>
<td>USB3.0 PHY</td>
<td>Ready</td>
<td>28nm → 16nm → 7nm</td>
</tr>
<tr>
<td>USB2.0 PHY</td>
<td>Ready</td>
<td>28nm → 16nm → 7nm</td>
</tr>
</tbody>
</table>
Summary
Future Prospects

- Start 7 nm / 5 nm IP development since 2019

- Increase AI and IoT application product lines
  - AI: USB 3.1, PCIe Gen4, In-memory Computing, High performance multiplier
  - IoT: A to D converter, D to A converter, Power management IP, Ultra-low power Std cell/ memory

- Provide “Platform” integrated value-added services
Summary

• M31 continues rapid growth with its IP supply platform of more than 10 foundry partners around the world.

• M31 has established strong partnerships with most tier-one IC design companies by meeting their IP needs completely.

• M31’s IPs possess superior PPA characteristics (power, performance, area) and bring competitive advantages to customers’ products.

• M31 will keep growing up unlimitedly in the future by grasping the opportunities of brisk growth in global IP industry with its unique competitive advantages.
The IP Boutique

We serve our customers with Ardour, insist on quality with Conviction, and continuously evolve our IP with Curiosity.

我們以熱情服務客戶，以信念堅持品質，以好奇心不斷進化IP。