

# NuMicro<sup>®</sup> MA35 Family

FHLIN@nuvoton.com

Joy of innovation  
**NUVOTON**

# Microcontroller Platform

**Feature**

A Audio BT Bluetooth C CAN CF CAN FD E Ethernet L LCD T Touch Key U USB V Video Codec M Motor P Power  
Low Power TrustZone AEC-Q100 **Operating Voltage** 1.8 1.8V 2.4 2.4V 3.3 3.3V 5 5V

Operating Frequency

8051

Cortex®-M0

Cortex®-M23

Cortex®-M4

Cortex®-M7

MPU

Cortex®-A35

MA35D1 U V E CF L U

MA35D0 U E CF U

MA35H0 U V E CF L U

Arm9™

NUC980 E C U

NUC970 E C L U

N9H V E C L U

N329 V E L U

AI

Cortex®-M55

M55M1

800 MHz  
650 MHz  
300 MHz

192 MHz

120 MHz

72 MHz

64 MHz

24 MHz

7 MHz

1.8	3.3	ML56	<span>U</span> <span>T</span> <span>L</span>	
1.8	3.3	ML54	<span>U</span> <span>L</span>	
1.8	3.3	5	ML51	<span>U</span>
3.3	5	MG51		
3.3	5	MS51		
3.3	5	N79E		
3.3	5	N76E		
1.8	3.3	5	MUG51	<span>U</span>

3.3	5	NUC1261	<span>U</span>
3.3	5	NUC126	<span>U</span>
3.3		M091	
3.3		M031G	
3.3		M029G/M030G	
1.8	3.3	M032	<span>U</span>
1.8	3.3	M031	
3.3	5	NUC029	<span>U</span>
1.8	3.3	M032BT	<span>BT</span> <span>U</span>
1.8	3.3	M031BT	<span>BT</span>
3.3	5	NUC230	<span>C</span>
3.3	5	NUC131U	<span>C</span>
3.3	5	NUC1311	<span>C</span>
2.4	5.5	ISD9160	<span>A</span>
2.4	5.5	ISD91500	<span>A</span>
2.4	5.5	ISD91200	<span>A</span>
1.8	5.5	N574	<span>A</span> <span>T</span>
1.8	5.5	N572	<span>U</span> <span>A</span> <span>T</span>
1.8	5.5	N570	<span>A</span> <span>T</span>
3.3	5	M0A23	<span>C</span>
3.3	5	M071	
3.3	5	M051	
3.3	5	Mini51	
1.8	3.3	Nano100	<span>U</span>

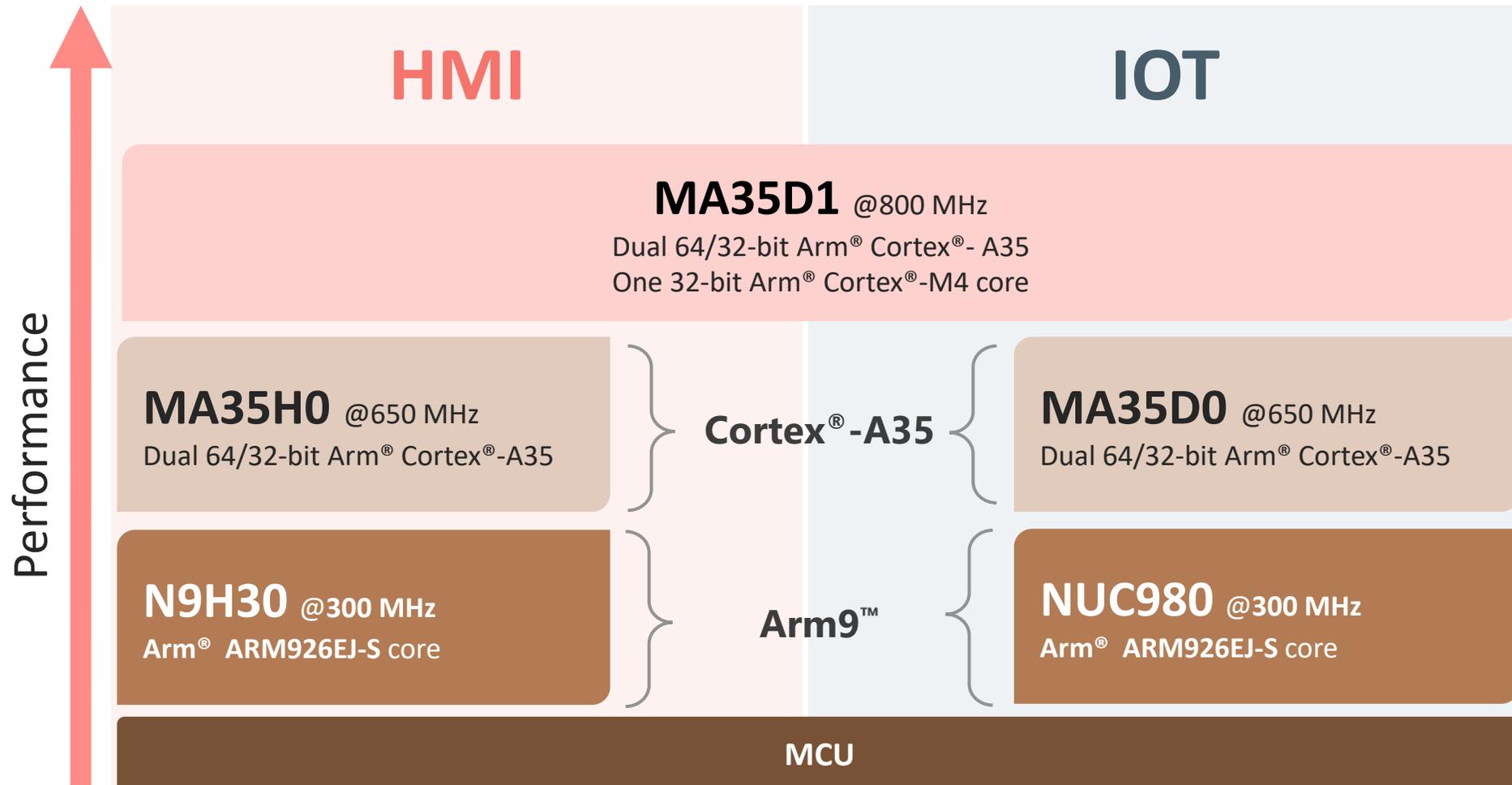
1.8	3.3	M2354	<span>U</span> <span>L</span>	
1.8	3.3	M2L31	<span>T</span> <span>C</span> <span>U</span>	
1.8	3.3	M2351	<span>U</span>	
3.3	5	NUC1263	<span>U</span>	
3.3	5	NUC1262	<span>U</span>	
1.8	3.3	M263	<span>C</span> <span>U</span>	
1.8	3.3	M262	<span>U</span>	
1.8	3.3	M261	<span>U</span>	
1.8	3.3	5	M258	<span>T</span> <span>L</span> <span>U</span>
1.8	3.3	5	M256	<span>T</span> <span>L</span>
1.8	3.3	5	M254	<span>L</span>
1.8	3.3	5	M253	<span>CF</span> <span>U</span>
1.8	3.3	5	M252	<span>U</span>
1.8	3.3	5	M251	<span>U</span>

1.6	3.6	ISD94100	<span>A</span> <span>U</span>
1.8	3.3	M480	<span>E</span> <span>C</span> <span>U</span>
1.8	3.3	M460	<span>E</span> <span>CF</span> <span>U</span>
1.8	3.3	M433	<span>C</span> <span>U</span>
3.3	5	M471	<span>U</span>
3	5	KM1M4BF	<span>M</span>
3.3	5	M453	<span>C</span>
3.3	5	M452	<span>U</span>
3.3	5	M451	<span>U</span>

5	KM1M7AF	<span>CF</span> <span>P</span>
5	KM1M7BF	<span>M</span>

1.8	3.3	5	MA35D1	<span>U</span> <span>V</span> <span>E</span> <span>CF</span> <span>L</span> <span>U</span>
1.8	3.3	5	MA35D0	<span>U</span> <span>E</span> <span>CF</span> <span>U</span>
1.8	3.3	5	MA35H0	<span>U</span> <span>V</span> <span>E</span> <span>CF</span> <span>L</span> <span>U</span>
1.8	3.3	5	NUC980	<span>E</span> <span>C</span> <span>U</span>
1.8	3.3	5	NUC970	<span>E</span> <span>C</span> <span>L</span> <span>U</span>
1.8	3.3	5	N9H	<span>V</span> <span>E</span> <span>C</span> <span>L</span> <span>U</span>
1.8	3.3	5	N329	<span>V</span> <span>E</span> <span>L</span> <span>U</span>

# Nuvoton MPU Platform



# NuMicro<sup>®</sup> MA35 Family MPU

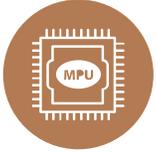
Series & CPU DDR	MA35D0 Dual A35@650 MHz			MA35D1 Dual A35@800 MHz
(External)				<b>MA35D16A087C</b>
DDR	512 MB	<b>MA35D16F987C</b>	<b>MA35D16A987C</b>	
	256 MB	<b>MA35D03F864C</b>	<b>MA35D16F887C</b>	<b>MA35D16A887C</b>
	128 MB	<b>MA35D03F764C</b>	<b>MA35D16F787C</b>	
Package	<b>LQFP216 (MCP DDR)</b> (24 x 24 mm)	<b>LQFP216 (MCP DDR)</b> (24 x 24 mm)	<b>BGA312 (MCP DDR)</b> (15 x 15 mm)	<b>BGA364</b> (14 x 14 mm)
Features	<ul style="list-style-type: none"> <li>• 2 sets of Megabit Ethernet</li> <li>• 3 sets of CAN-FD</li> <li>• 11 sets of UART</li> <li>• 154 x GPIO</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-core Cortex-M4 @180 MHz</li> <li>• Megabit + Gigabit Ethernet</li> <li>• 4 sets of CAN-FD</li> <li>• 17 sets of UART</li> <li>• 154 x GPIO</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-core Cortex-M4 @180 MHz</li> <li>• 2 sets of Gigabit Ethernet</li> <li>• 4 sets of CAN-FD</li> <li>• 17 sets of UART</li> <li>• EADC</li> <li>• 208 x GPIO</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-core Cortex-M4 @180 MHz</li> <li>• 2 sets of Gigabit Ethernet</li> <li>• 4 sets of CAN-FD</li> <li>• 17 sets of UART</li> <li>• EADC</li> <li>• 208 x GPIO</li> </ul>
Security	<ul style="list-style-type: none"> <li>• TrustZone &amp; Secure Boot</li> <li>• Practical Hardware Security</li> </ul>		<ul style="list-style-type: none"> <li>• TSI Advanced Security</li> <li>• TrustZone &amp; Secure Boot                             <ul style="list-style-type: none"> <li>• Temper pins</li> </ul> </li> </ul>	
Display & Video	<ul style="list-style-type: none"> <li>• 720P Display</li> </ul>		<ul style="list-style-type: none"> <li>• 1080P Display + H.264 Decoder</li> <li>• 2 sets of Camera Interface</li> </ul>	
Operating Temp. (Tj)	-40°C ~ +125°C		-40°C ~ +105°C	

# NuMicro<sup>®</sup> MA35D0 Series MPU

Series & CPU	
DDR	
(External)	
512 MB	
DDR	
256 MB	MA35D03F864C
128 MB	MA35D03F764C
Package	LQFP216 (MCP DDR) (24 x 24 mm)

- **Dual 64-bit Arm<sup>®</sup> Cortex<sup>®</sup>-A35** high-performance cores running up to 650 MHz
- **LQFP package parts with stacking a DDR SDRAM up to 256 MB**
- **High-speed connectivity**
  - 2 sets of Megabit Ethernet
  - 1 set of SDIO3.0, 1 set of SDIO2.0
  - 1 set of USB HS Host
  - 1 set of USB HS Host/Device dual role
  - 3 sets of CAN FD
  - 11 sets of UART
- **Display**
  - Integrated a 2D Graphic Engine
  - JPEG decoder

# NuMicro<sup>®</sup> MA35D0 Series Features



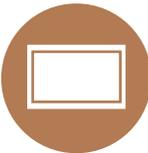
## Core & Memory

- Dual 64-bit/32-bit Arm Cortex-A35 high-performance cores running up to 650 MHz
- 32 KB I/D L1 cache for each core, and a 512 KB shared L2 cache
- Supports discrete power supply and PMIC solutions
- Operating temperature (Tj): -40°C ~ +125°C
- Offering LQFP package parts with stacking a DDR SDRAM up to 256 MB



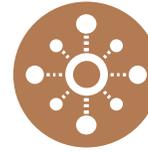
## Security

- TrustZone
- Secure Boot
- Hardware Security Features
  - Crypto Engine: AES256, SHA512, ECC, RSA4096, SM2/3/4
  - True Random Number Generator (TRNG)
  - 8 Kbits One Time Programmable (OTP) memory with Key Store to protect key



## Display

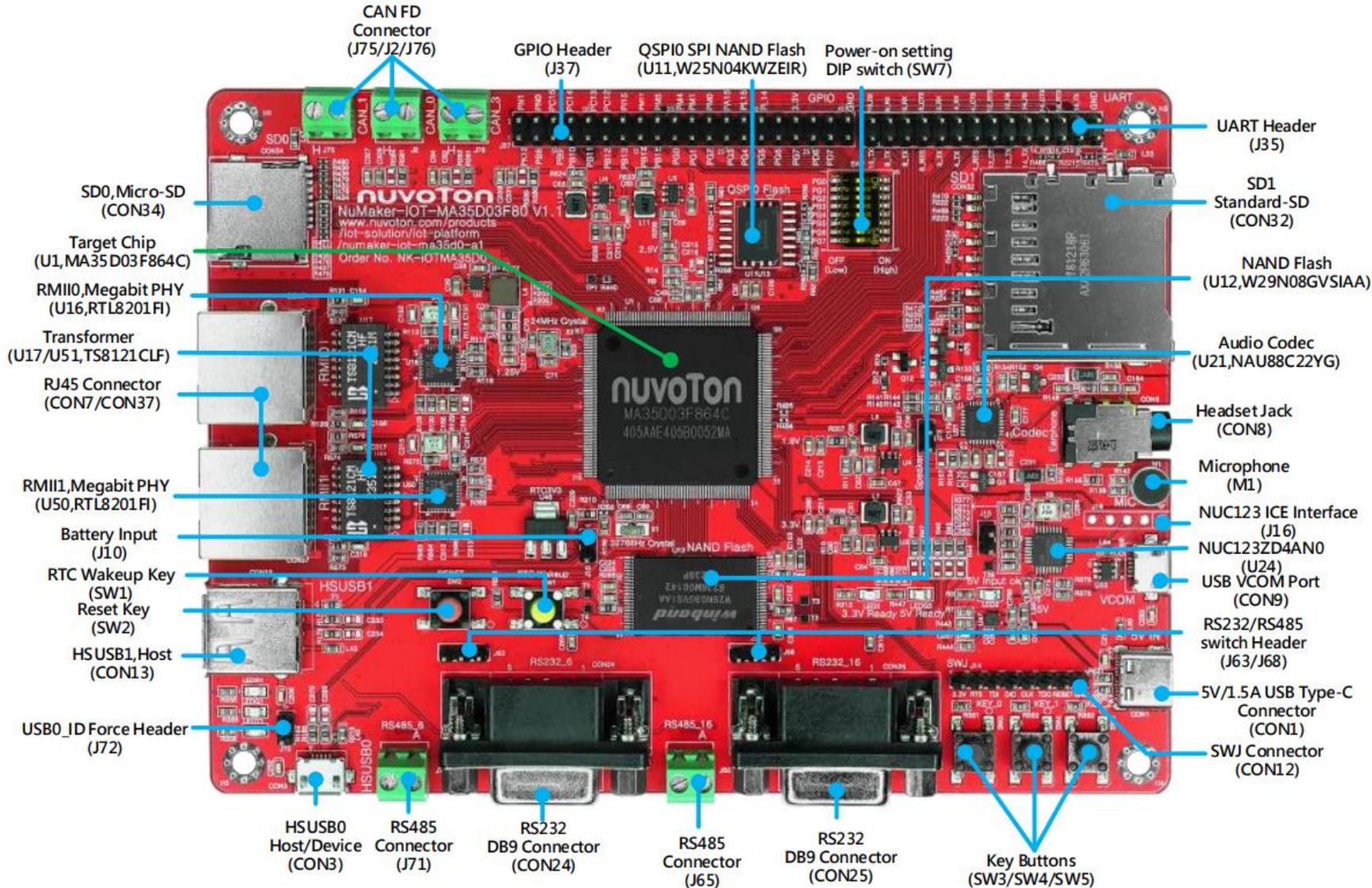
- LCD RGB I/F display with the resolution up to 1280 x 800@60 FPS
- Integrated a 2D Graphic Engine
- JPEG decoder, picture size up to 16368 x 16368



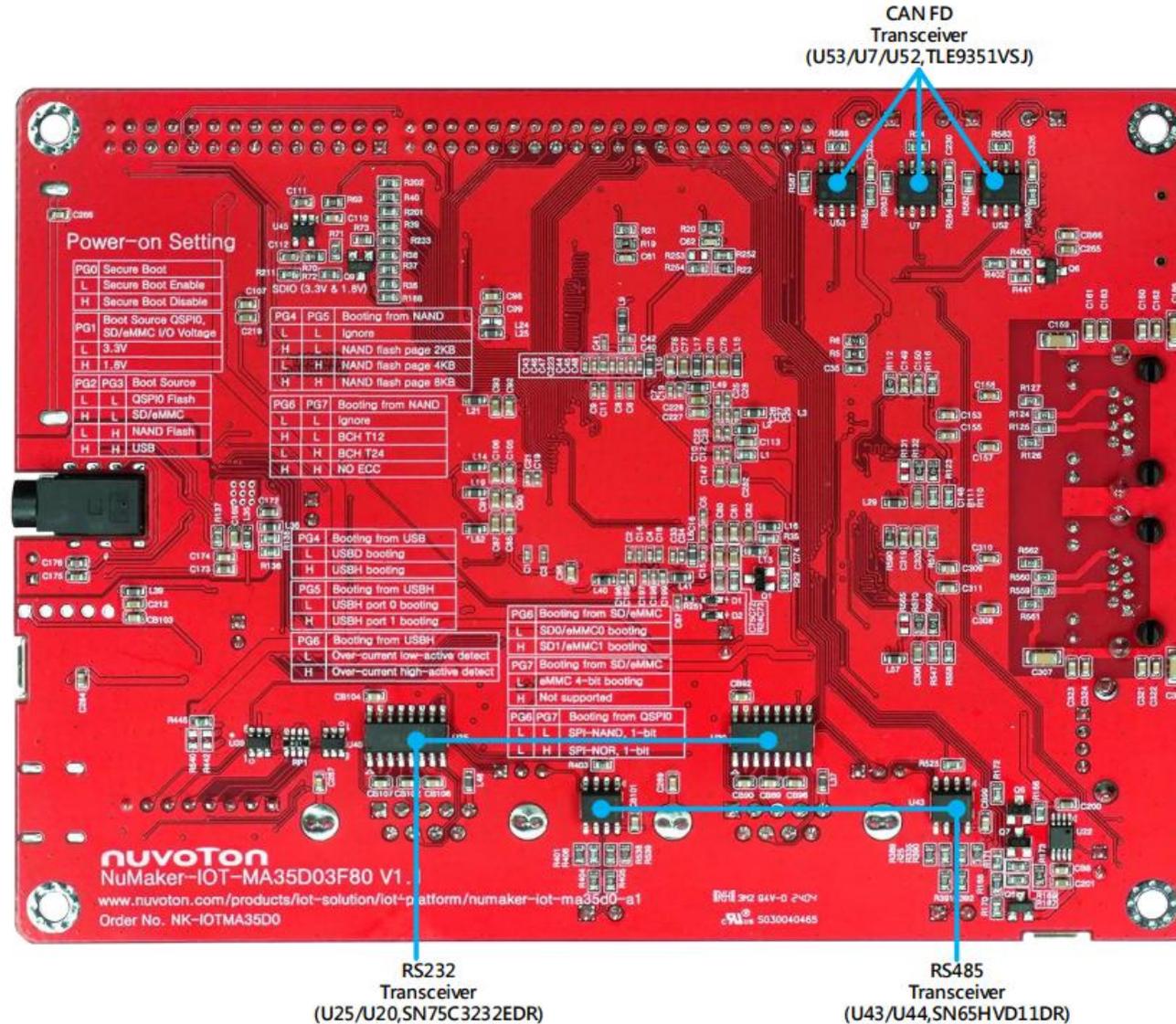
## High-Speed Connectivity & I/O

- 4 sets of PDMA
- 2 set of 10/100 Mbps Ethernet
- 1 set of USB HS Host, 1 set of USB HS Host/Device dual role
- 1 set of SDIO3.0 and 1 set of SDIO2.0
- 3 sets of CAN FD
- 1 sets of QSPI
- 1 sets of I<sup>2</sup>S
- 2 sets of SPI/I<sup>2</sup>S
- 11 sets of UART
- 3 sets of I<sup>2</sup>C
- Up to 150x GPIO (LQFP216)
- 18-channel 28-bit Enhanced PWM (EPWM)
- 12-channel 32-bit Timer PWM (Timer PWM)
- RTC with V<sub>BAT</sub>
- 1 set of 12-bit 500 ksps ADC with 8 input channels, supports 4/5-wire resistive touch

# NuMaker-HMI-MA35H0-A1 EVB Front View



# NuMaker-HMI-MA35H0-A1 EVB Rear View



# NuMaker-IoT-MA35D0-A1 EVB

## Features

- MA35D03F864C / LQFP216 package (MCP with 256MB DDR)
- Dual Cortex-A35, CPU speed up to 650MHz
- Discrete power supply
- Memory Device
  - NAND Flash 1GB
  - QSPI NAND Flash 512MB
  - SD3.0 (Standard SD slot) x1, SD2.0(Micro SD slot) x1
- High-speed Connectivity
  - Megabit Ethernet x2
  - USB2.0 HS Host x1, USB2.0 HS Host/Device x1
  - CAN FD x3
  - RS485 / RS232 x2
- Audio Codec (NAU88C22YG) with Mic & Headset Jack
- Analog and Digital I/O header

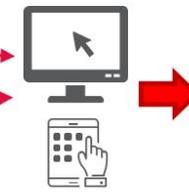
## EVb Info

- EVB Web Page for Introduction
- PN: NuMaker-IoT-MA35D0-A1
- Ordering Number: NK-IMA35D0A1



The MA35D0 EVB is pre-loaded with remote operation examples

- Access system status via web browser.
- Seamless exchange of information between EVBs on the same network.
- Cloud connection can be achieved via Ethernet or Wi-Fi/4G.
- Web server application integration of Node.js/HTML5.



**nuvoton**  
NuMaker-IoT-MA35D0-A1  
Remote Control Demo

Send message to all device:

<b>Device Information</b> IP: 192.168.0.183 UID: 002700F101675BD000000478 <input type="button" value="Identify Device"/>	<b>Usage Information</b> CPU: 49% MEM: 51/230 MB (22.17%) Temperature: 46°C	LED_R <input type="checkbox"/> Key0: 20 LED_G <input type="checkbox"/> Key1: 17 LED_Y <input type="checkbox"/> Key2: 12	
<b>Device Information</b> IP: 192.168.0.177 UID: 002700F101675BD000000460 <input type="button" value="Identify Device"/>	<b>Usage Information</b> CPU: 45% MEM: 49/230 MB (21.30%) Temperature: 44°C	LED_R <input type="checkbox"/> Key0: 5 LED_G <input type="checkbox"/> Key1: 3 LED_Y <input type="checkbox"/> Key2: 4	

# Power-on-Setting

- Options for secure boot enable or disable:

SW7.1 / PG0*	Secure Booting
Low	Enable
High	Disable

**Note** \*: The GPIO PG0 is internal weakly pull-down.

- Options for booting source selection:

SW7.4 / PG3*1	SW7.3 / PG2*1	Booting Source
Low	Low	QSPI0 Flash
Low	High	SD/eMMC*2
High	Low	NAND Flash
High	High	USB

**Note** \*1: These GPIO PG2 and PG3 are internal weakly pull-down.  
**Note** \*2: There's only SD0 micro card slot on this NuMaker-HMI-MA35H04F70 board.

# Source

nuvoTon

Support ▾ Foundry Service About Nuvoton ▾

Products ▾ Applications ▾ Software and Tool ▾ Product Related Information ▾ AI Discovery

Home Products > Microprocessors > Arm Cortex-A35 MPUs > MA35H0 Industrial HMI Series

## MA35H0 Industrial HMI Series

Overview

Resources

Video Center

Where to buy

Document (22) >> Hardware (1) >> Software (7) >>

Data Sheet (1) User Manual (14) Technical Reference Manual (1) Application Note (4) Schematic, PCB and Gerber file (1) Presentation PPT (1)

Resources: User Manual(14)

Update: Start date [calendar icon] End date [calendar icon]

Please enter a keyword: [input field]

Search Reset

Page 1 of 1 with 20 items Change

Resources	Download
<input type="checkbox"/> User Manual	RH_NuTool-PinConfigure_V1.29.0001
<input type="checkbox"/> User Manual	RH_NuEclipse_EN_V1.07...
<input type="checkbox"/> User Manual	UM_EN_MA35_NuWriter
<input type="checkbox"/> User Manual	UM_EN_MA35_NAND
<input type="checkbox"/> User Manual	UM_EN_MA35_SWriter
<input type="checkbox"/> User Manual	MA35 High-Speed IP Calibration Tool User Manual

# User Manual

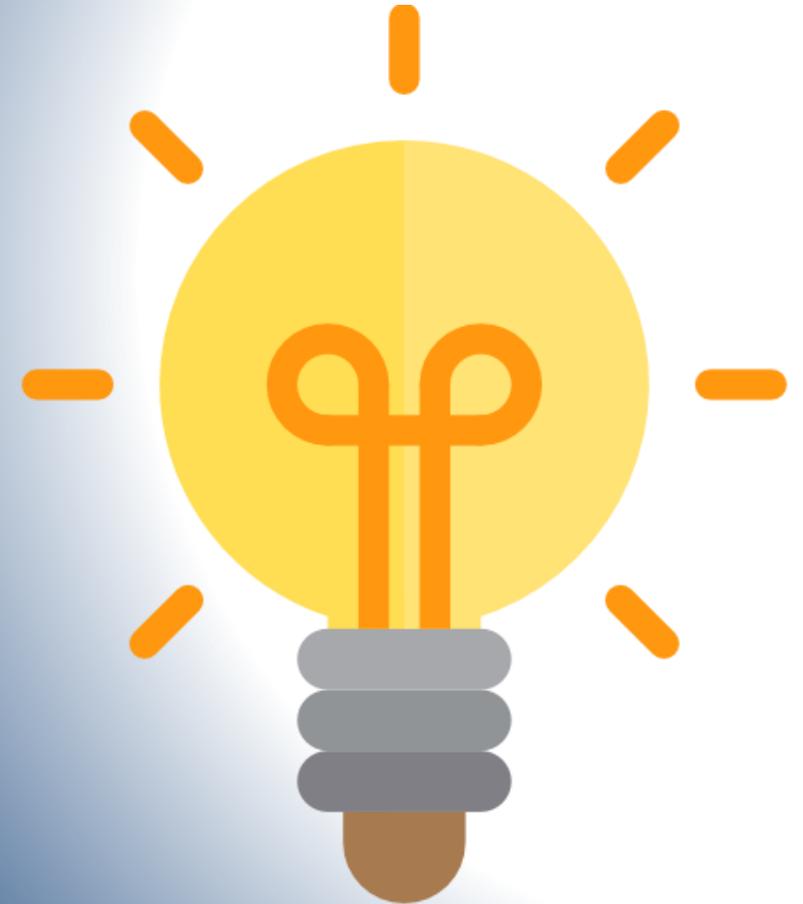
Official Website



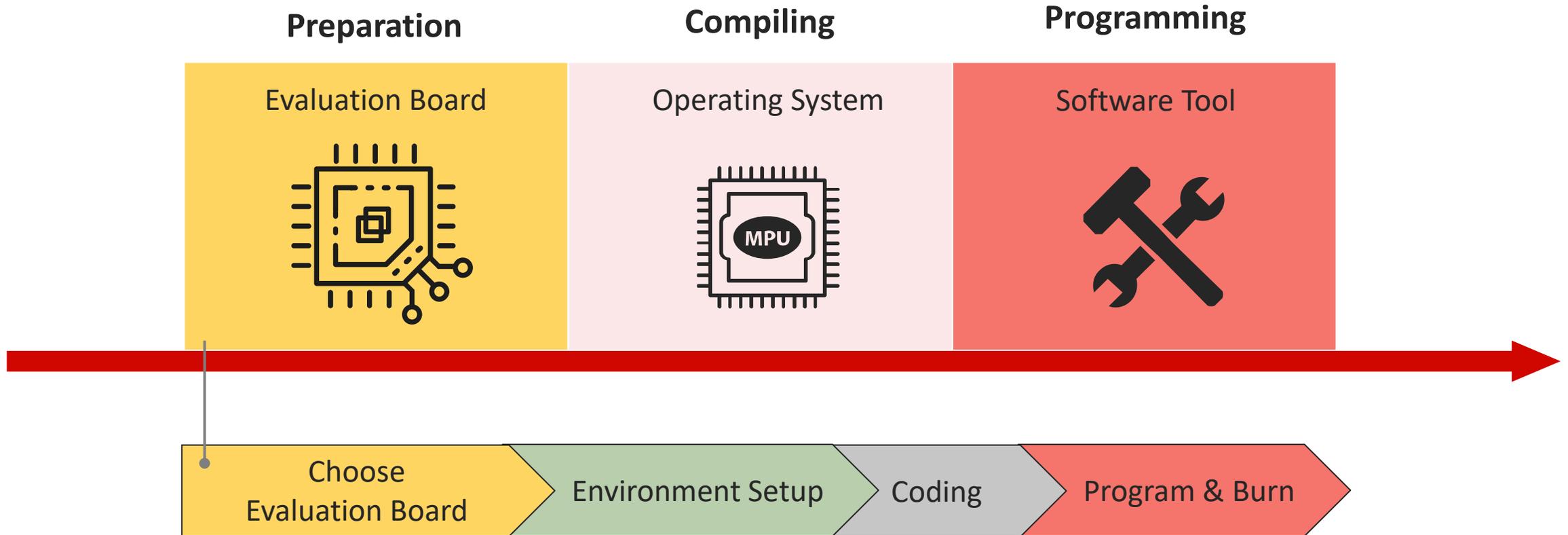
nuvoTon  
www.nuvoton.com

# NuMicro<sup>®</sup> Development Platform

Evaluation Board / BSP / IDE / Software Tool /  
Debugger & Programmer



# | Golden 3 Steps of Evaluation



# NuDeveloper Ecosystem – Make Engineers’ Jobs Easier

<p><b>nuvoton.com</b> Product Information / Documents / Selection</p>	<ul style="list-style-type: none"> <li>• <b>Online Support:</b> NuForum / Sales Support Mailbox / Online Chat</li> <li>• <b>Social Media &amp; Knowledge Base:</b> LinkedIn / Facebook / Twitter / WeChat</li> <li>• <b>Video Platform:</b> YouTube / bilibili</li> <li>• <b>Open Resource:</b> Github / Gitlab / Gitee</li> </ul>	<p><b>Online buy</b></p> <ul style="list-style-type: none"> <li>• Nuvoton Direct</li> <li>• Tmall</li> <li>• TechDesign</li> <li>• DigiKey</li> </ul>
<p><b>Digital Platform</b></p>		

<p>arm KEIL IAR Embedded Workbench NuEclipse NuEdgeWise</p> <p style="text-align: center;">IDE</p>	<p>MCU BSP (API Compatible) / Linux BSP/ Peripheral Driver / Library / Rich Sample Code Third party resource</p> <p style="text-align: center;">BSP &amp; Example Code</p>
<p>Nu-Link2-Pro/ Nu-Link2-Me Nu-Link-Gang/ Gang Writer</p> <p style="text-align: center;">Debugger &amp; Programmer</p>	<p>NuIDE/ UltraIO/ VR Lib / CodeGenerator/ PinView / PinConfig/ ClockConfig / LCDView / TouchView/ ICP/ISP Programming/ Nu-Link Command/ USB to Serial Port / NuAudio</p> <p style="text-align: center;">Software Tool(NuTool)</p>
<p>NuMaker Series / Motor Control Series / Power Control Series</p> <p style="text-align: center;">Evaluation Board</p>	
<p><b>Development Platform</b></p>	

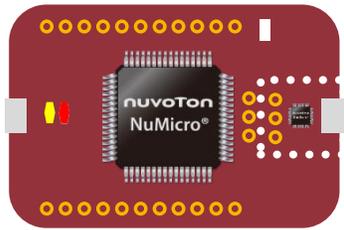
<p style="text-align: center;"><b>HMI Platform</b></p> 	<p style="text-align: center;"><b>IoT Device and Gateway</b></p> 	<p style="text-align: center;"><b>DALI 2 Solutions</b></p> <p>Supports all control gear and control/ input device certified library protocol.</p> <table border="1"> <tr><td>102</td><td>103</td></tr> <tr><td>202</td><td>301</td></tr> <tr><td>206</td><td>302</td></tr> <tr><td>207</td><td>303</td></tr> <tr><td>208</td><td>304</td></tr> <tr><td>209</td><td></td></tr> </table>	102	103	202	301	206	302	207	303	208	304	209	
102	103													
202	301													
206	302													
207	303													
208	304													
209														
<p><b>Platform</b></p>														

BMS	LCD Touch Key	Cold Chain	Thermostat
Lighting Control	HDMI2.1	USB Type-C PD3.1	AR & VR
<p><b>Reference Design Platform</b></p>			

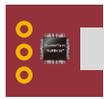
8051 / M0 / M23 / M4 / M7 / Arm9 / A35 based Microcontroller

**NuMicro® Microcontroller Platform**

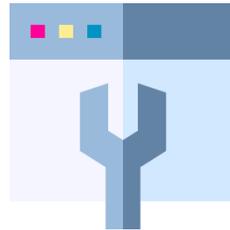
# NuMicro<sup>®</sup> Development Platform



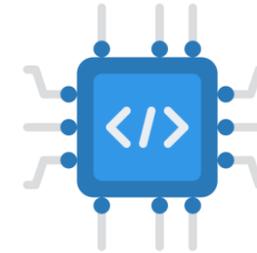
**Evaluation Board  
(NuMaker)**



**Debugger & Programmer  
(Nu-Link)**



**Software Tool  
(NuTool)**



**Embedded Software  
(BSP & Example Code)**



**IDE and Driver**

Evaluation Board (NuMaker)		Debugger & Programmer (Nu-Link)		Software Tool (NuTool)			Embedded Software (BSP & Example Code)		IDE and Driver	
General	Application Specific	1 to 1 Debugger & Programmer	MP Programmer	Programming	General	Application Specific	Board Support Package (BSP)	Example Code	MCU	MPU
NuMaker	DALI IoT HMI	Nu-Link Nu-Link-Pro Nu-Link2-Pro Nu-Link-Me Nu-Link2-Me	Nu-Link-Gang	ICP ISP Nu-Link Command NuWriter NAND Writer	PinConfigure PinView ClockConfigure CodeGenerator USB to Serial Port	DALIController LCDView TouchView	Peripheral Drivers Reference Guide PDF/HTML Library IEC 60730/emWin Operating System Linux/RT-Thread Security TF-A/OP-TEE	Designed with NuMicro Family Audio Codec Lighting Fan speed detect SPI flash control Sensor	Keil MDK IAR EWARM NuEclipse Windows or Linux	Docker Yocto Project Buildroot OpenWRT Env (RT-Thread)

# NuMicro<sup>®</sup> Digital Platform

Official Website



**nuvoTon**  
www.nuvoton.com

Online Store



**nuvoTon**  
DIRECT

direct.nuvoton.com

Forum



**NuForum**

forum.nuvoton.com

Social Media



**facebook**

www.facebook.com/NuvotonNuMicro

Source Code Download



**GitHub**

github.com/OpenNuvoton



**天猫 TMALL.COM**

nuvoton.tmall.com



**牛卧堂**

www.nuvoton-MCU.com



**LinkedIn**

@Nuvoton Technology Corporation



**GitLab**

gitlab.com/OpenNuvoton



**TECHDesign**

www.techdesign.com/market/nuvoton



**21ic 中国电子网**

bbs.21ic.com/iclist-187-1.html



**X**

@NuvotonMCU



**G 码云**

gitee.com/OpenNuvoton

*Joy of innovation*  
**nuvoTon**

谢谢

謝謝

Děkuji

Bedankt

Thank you

Kiitos

Merci

Danke

Grazie

ありがとう

감사합니다

Dziękujemy

Obrigado

Спасибо

Gracias

Teşekkür ederim

Cảm ơn