
Organizationally Unique Identifiers for Preprogrammed EUI-48™ and EUI-64™ Address Devices

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INTRODUCTION

EUI-48™ and EUI-64™ are globally unique identification numbers, standardized and provided by the IEEE Registration Authority. Both standards are composed of a 24-bit Organizationally Unique Identifier (OUI) followed by an extension identifier. EUI-48 uses a 24-bit extension identifier for a total of 48 bits, while EUI-64 uses a 40-bit extension identifier for a total of 64 bits. Both formats provide a value that is ensured to be unique.

The difference between EUI-48 and media access control addresses is entirely nominal. Every EUI-48 number is also a valid MAC-48 number as defined by IEEE for IPv4 and IPv6 networking applications.

EUI-48 and EUI-64 have applications far beyond networking and are a convenient and reliable solution for any application where a universally unique identification number is required, from production device serialization and validating secure assemblies to digital rights management and software-hardware licensing applications.

ENCAPSULATION

To provide interoperability between EUI-48 and EUI-64, IEEE offers a standard for encapsulating any EUI-48 number to produce a valid EUI-64 number that is still ensured to be universally unique. This is accomplished by the application software inserting a specific 16-bit pattern between the OUI and extension identifier (FF-FE), bringing the length of the number up to the full 64 bits required. FF-FE is specially reserved from EUI-64 by IEEE for this purpose.

Associated Part Numbers

- 24AA02E48, 24AA025E48, 24AA02E64, 24AA025E64
- 25AA02E48, 25AA02E64
- 11AA02E48, 11AA02E64
- 93AA46AE48
- 24AA256UID
- AT24MAC402, AT24MAC602
- MCP79401, MCP79402
- MCP79411, MCP79412
- MCP79511, MCP79512
- MCP79521, MCP79522
- MCP795W11, MCP795W12
- MCP795W21, MCP795W22
- SST26VF064BEUI, SST26VF032BEUI, SST26VF016BEUI

OUI DESCRIPTION

Each OUI provides roughly 16 million (2^{24}) unique EUI-48 addresses and over 1 trillion (2^{40}) unique EUI-64 addresses. Once all unique EUI-48 or EUI-64 extension identifiers for the current OUI are exhausted, Microchip acquires a new OUI from the IEEE Registration Authority so that Microchip can continue to provide this programming service. As a result, the OUI programmed into a specific EUI-48 or EUI-64 address device will change as each OUI is exhausted. However, there is no assurance that the customers will receive a specific OUI. Thus, they should design their application to accept a new OUI as more are introduced.

Microchip's OUIs, both historical and current, are listed below:

- | | |
|------------|------------|
| • 00-04-A3 | • 80-34-28 |
| • 00-1E-C0 | • FC-0F-E7 |
| • D8-80-39 | • 9C-95-6E |
| • 54-10-EC | • 44-B7-D0 |
| • FC-C2-3D | • D8-47-8F |
| • 80-1F-12 | • 40-84-32 |
| • 04-91-62 | |
| • 68-27-19 | |
| • E8-EB-1B | |

FIGURE 1: EUI-48™ NODE ADDRESS EXAMPLE

Description	24-bit Organizationally Unique Identifier			24-bit Extension Identifier		
	00h	04h	A3h	12h	34h	56h
Data						
Corresponding EUI-48™ Node Address: 00-04-A3-12-34-56						
Corresponding EUI-64™ Node Address After Encapsulation ⁽¹⁾ : 00-04-A3-FF-FE-12-34-56						
Note 1: Encapsulation must be performed by the application software.						

FIGURE 2: EUI-64™ NODE ADDRESS EXAMPLE

Description	24-bit Organizationally Unique Identifier			40-bit Extension Identifier				
	00h	04h	A3h	12h	34h	56h	78h	90h
Data								
Corresponding EUI-64™ Node Address: 00-04-A3-12-34-56-78-90								

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ISBN: 978-1-6683-4011-0

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