NuMicro® Family

Arm® Cortex® -M0-based Microcontroller

NuMotor NK-NM18407L
Quick Start Page

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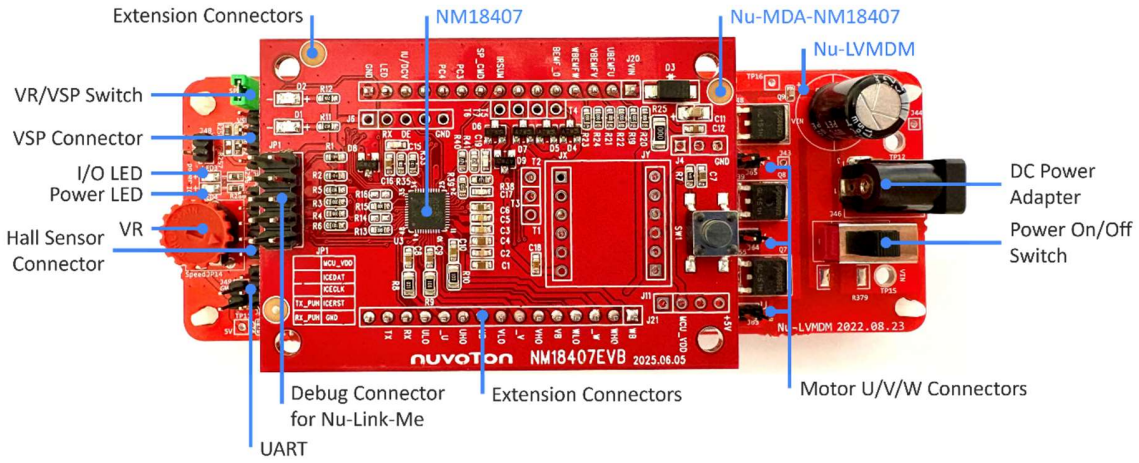
1 ENGLISH

Board Introduction

The NK-NM18407L is an evaluation board (EVB) featuring a Multi-Chip Package (MCP) that integrates an ARM Cortex-M0 MCU (NM1244) and a 40V N/N-based gate driver (NCT3612), along with external MOSFETs and variable resistors for controlling motor drive waveform and current phase. It supports the operation of three-phase brushless DC motors (BLDCMs) and permanent magnet synchronous motors (PMSMs), delivering a continuous drain current (IDSM) of 16.5A in 15V–24V DC rail or battery-powered applications.

The NK-NM18407L is designed for project evaluation, prototype development, and validation, allowing users to verify the functionality of motor application-based example code. For further development details, users can refer to the TRM and BSP of the NM1244 for NM18407 software development.

The NK-NM18407L includes the Nuvoton Low Voltage Motor Development Module (Nu-LVMDM) and the Nuvoton Motor Development Adapter (Nu-MDA-NM18407). The Nu-LVMDM serves as the power stage, while the Nu-MDA-NM18407 functions as the microcontroller stage. Note that the NK- NM18407L does not include a debugging tool, so users will need additional ICE debugging equipment, such as the Nu-Link-Me, for development.



Board Features

- Motor Drive Interfaces
  - DC input: 15V~24V (J46 or J43/Vin and J44/GND)
  - Hall sensor interface for sensor-based motor control (J41)
  - Phase voltage sensing for sensorless ZCP-based motor control
  - DC bus voltage sensing for over-voltage/under-voltage protection
  - Idc and Iuvw current sensing for hardware/software-based over-current protection
  - Idc and phase current (Iuv) sensing for single/two-shunt-based FOC
- Motor Application Functions
  - Hall sensor-based square-wave drive and 1R/2R FOC drive
  - Sensorless FOC drive
- Input/Output Control Switches
  - One LED indicator for debugging purposes (LED2/LED3)
  - 50 kΩ variable resistor (JP14)
  - SMD-based switch for configuration purposes (SW5)
- Communication Interface
  - UART communication via USB (J66)
- Power Supply Interfaces
  - Auxiliary Power Tab Fast-On connectors (J43/Vin and J44/GND) for the controller and power stage
  - Dedicated power connector (J46) for the controller and power stage
- Programming Interface
  - Nu-Link-Me connector for Nu-MDA-NM18407 (JP1)

Quick Start

1. Install the preferred toolchain. Ensure that at least one of the following toolchains is installed:
   - KEIL MDK Nuvoton edition – Full Cortex-M
   - IAR EWARM
2. Download and install the latest Nuvoton Nu-Link driver:
   - For Keil MDK: Download and install Nu-Link_Keil_Driver.
   - For IAR EWARM: Download and install Nu-Link_IAR_Driver.
3. Download and extract the Board Support Package (BSP) or Motor Drive Example Code.
4. Hardware Setup
   (1). Connect the Nu-Link-Me connector (JP10) to the PC's USB port using a USB cable.
   (2). Connect the J63/J52 (U), J64/J53 (V), J65/J57 (W) connectors and the J41 (Hall Sensor) connector to the motor's U/V/W terminals and Hall sensor.
   (3). Connect the J46 or J43 (Vin) and J44 (GND) connectors to the power supply.
5. Find the "Template.uvprojx" project file in the example code folder.

   🗁 [Example Code] NM1244 based Sensorless FOC for Fan Appl_Rev1.1
   🗁 SW
   🗁 SampleCode
   🗁 Template
   🗁 Keil
   🗁 Template.uvprojx

6. Open and execute the project in the toolchain. For detailed settings, please refer to "UM_NM1244 based Sensorless FOC_Rev1.1_EN" and "QS_NuMotor NK-NM18407L_Quick_Start_Rev0.01".
7. After setting all the required parameters, turn on the VR or VSP to run the motor and verify its performance.

2 EVISION HISTORY

Date	Revision	Description
2025.05.21	0.01	1. Initial version for NK-NM18407L

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