Quick Start Guide

S12ZVM-EFP Reference Design Board

Enabling BLDC or PMSM fuel pump applications

S12ZVM-EFP REFERENCE DESIGN BOARD (RDB)

GET TO KNOW THE S12ZVM-EFP BOARD
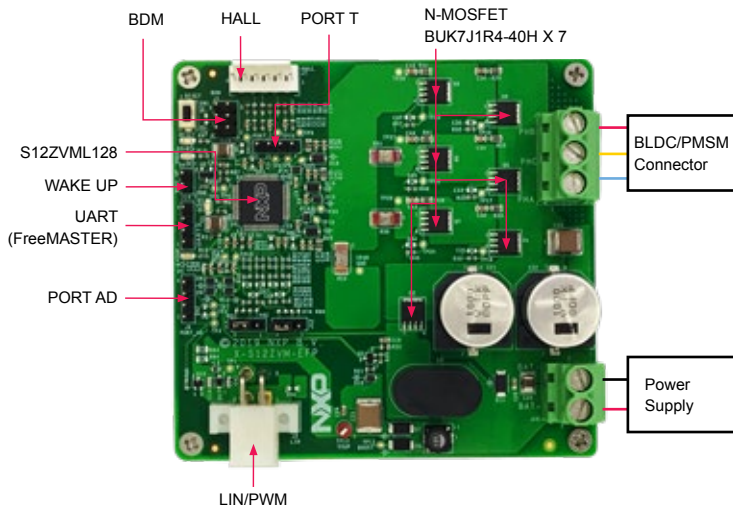

Figure 1: Front side of S12ZVM-EFP RDB

Figure 2: Back side of S12ZVM-EFP RDB

S12ZVM-EFP RDB FEATURES

- 12 V system application; supply voltage range from 8 V to 16 V

- Up to 250 W input power at 13 V supply voltage

- Supports BLDC/PSM sensorless FOC control, both dual shunt and single shunt

- Robust and fast start up, meets the strict start up condition < 150 ms from standstill to the rated speed for fuel pump motor

- Supports speed command from LIN/PWM/FreeMASTER (default setting is FreeMASTER)

- Supports multiple diagnose and protection covering UV, OV, OT, OC, short, stall detection, etc.

- Not only supports fuel pumps, but also suitable for other automotive BLDC/PSM applications

STEP-BY-STEP INSTRUCTIONS

Firstly, install CodeWarrior® Development Studio V11 or a newer version for the S12Z MagniV® device.

Secondly, install FreeMASTER Run-time debugging tool used to tune the motor.

1 Download Software

Download installation software and documentation at **nxp.com/S12ZVM-EFP**.

2 Connect the cable and a debugger like PE Multilink

Connect power supply cables and fuel pump or other 3-phase BLDC/PMSM cables to the board. Connect the PE Multilink debugger to BDM port (J1) onboard and another end to the PC. Connect an SCI to USB wire (FreeMASTER) to UART port (J4) PIN2, PIN3 and PIN4 and another end to the PC USB port.

STEP-BY-STEP INSTRUCTIONS CONTINUED

3 Set Up DC Power Supply

Connect power supply wires to the DC power supply. Set the voltage at 12 V and the current limit to 20 A. Check and make sure all connections are right.
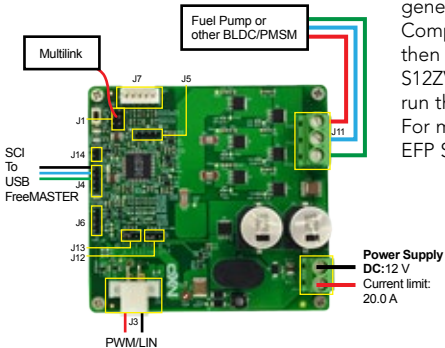
4 Program Example Codes

Open CodeWarrior and load example projects. Power up the board. Open FreeMASTER in the S12ZVM-EFP Software Quick Start Package. Configure the connected motor parameters and other parameters in MCAT and generate the "PMSM_appconfig.h" file. Compile and program the project and then connect the FreeMASTER with the S12ZVM-EFP board. After that, you can run the motor by using FreeMASTER. For more details, refer to S12ZVM-EFP Software User Guide (SWUG).

Multilink

Fuel Pump or other BLDC/PMSM

SCI To USB FreeMASTER

J7   J5

J1

J14

J4

J6

J13
J12

J11

Power Supply
DC: 12 V
Current limit:
20.0 A

J3

PWM/LIN

HEADERS AND CONNECTORS LIST

HEADER/CONNECTOR	DESCRIPTION
J1	For BDM, PIN1-BKGD, PIN2-GND, PIN3-NC, PIN4-RESET, PIN5-NC, PIN6-VDDX
J3	For LIN and PWM, PIN1-GND, PIN2-GND, PIN3-NC, PIN4-LIN/PWM
J4	For UART TTL FreeMASTER, PIN1-VDDX, PIN2-TXD1, PIN3-RXD1, PIN4-GND
J5	For PORTT and external SPI, PIN1-PT3/SS0, PIN2-PT2/SCK0, PIN3-PT1/MOSI0, PIN4-PT0/MISO0
J6	For external ADC, PIN1-PAD3, PIN2-PAD4, PIN3-PAD8, PIN4-GND
J7	For hall sensor, PIN1-EVDD, PIN2-GND, PIN3-HALL_A, PIN4-HALL_B, PIN5-HALL_C, PIN6-NC
J10	For power supply, PIN1-VBAT+, PIN2-VBAT-
J11	For motor connector, PIN1-PHA, PIN2-PHC, PIN3-PHB
J12	For dual-shunt and single-shunt jumper
J13	For dual-shunt and single-shunt jumper
J14	For K15 line to wake up, PIN1-K15 line, PIN2-GND

HEADERS AND CONNECTORS LIST

JUMPER	OPTION	SETTING	DESCRIPTION
J12	Current sampling routine	1-2	For single-shunt current sampling
		2-3	Default setting; for dual-shunt current sampling
J13	Current sampling routine	1-2	For single shunt-current sampling
		2-3	Default setting; for dual-shunt current sampling

SUPPORT

Visit **www.nxp.com/support** for a list of phone numbers within your region.

WARRANTY

Visit **www.nxp.com/warranty** for complete warranty information.

Get Started

Download installation software and documentation at **nxp.com/S12ZVM-EFP**.

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