EVB-VF522R3
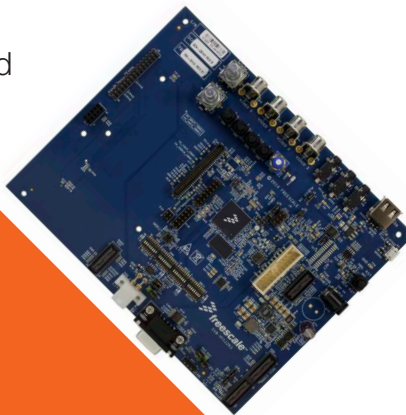# Quick Start Guide

EVB-VF522R3

Evaluation Platform for the
Vybrid R Series Products used
in Automotive Applications
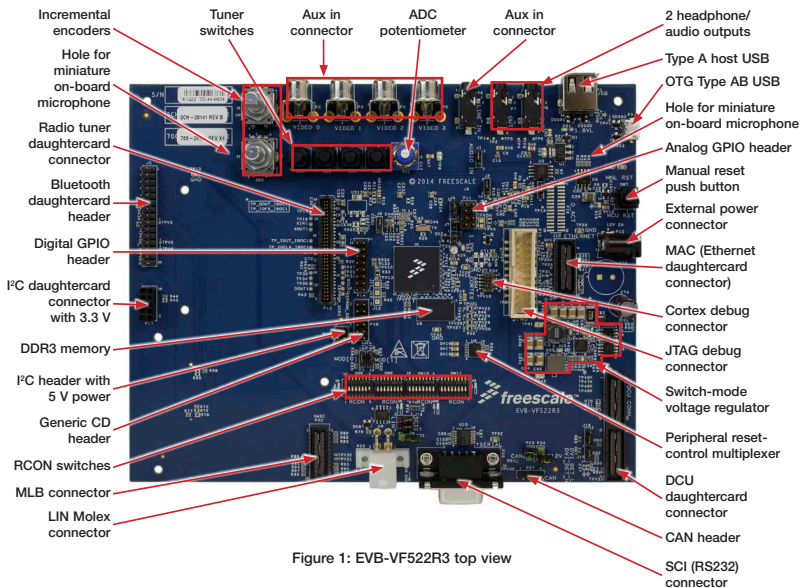
About EVB-VF522R3

The EVB-VF522R3 Evaluation platform for the Vybrid R Series products is ideal for cost-optimized Automotive Connected Radio and Infotainment systems. The heterogeneous dual-core Vybrid series of applications processors represents our scalable family of products powered by single ARM® Cortex®-A5 core and dual-core Cortex-A5 + Cortex-M4 implementations for the automotive market. With its processing speeds and high level of integration, the Automotive EVB-VF522R3 enables customers to re-create today's consumer user experiences in the car.

EVB-VF522R3 Features

- Powered from 12±2 V DC supply
- 1 Gb (64 M x 16) DDR3 IC
- Three 256 Mb (32 MB) QuadSPI Flash ICs
- SD Card slot
- Boot configuration jumpers and full 32-bit RCON switches
- Two incremental encoders
- Four dedicated station preset buttons
- Potentiometer connected to Vybrid ADC
- Unified 24-bit DCU connector (matches Freescale LCD and HDMI daughtercards) with analog and I²C support for basic touchscreen operation
- Four analog video inputs with direct connection to Vybrid video ADC
- 0.1" headers for all GPIO and analog signals not used elsewhere on the board
- "Aux In" connector (3.5 mm) with filter and dedicated audio ADC
- Left and right SPI-based microphones
- Standalone DSP for audio processing
- SPI serial 32 Mb Flash IC (dedicated to DSP, optional usage)

- Twin dedicated audio DAC, filter and headphone amplifiers for audio outputs (3.5 mm connectors)
- Radio-tuner daughtercard connector
- I²C header for custom-made daughtercard powered from 3.3 V
- I²C header for daughtercard powered from 5 V
- Bluetooth daughtercard header
- MLB daughtercard connector
- Board-to-Board connector bearing one 10/100 Mbit/s RMII MAC (Ethernet) interface
- Generic CD header
- 20-pin JTAG debug header
- 10-pin Cortex debug header
- Two Vybrid USB interfaces: Micro-AB and Standard-A connectors with full 500 mA support each
- High-speed CAN transceiver
- SCI/RS232 and LIN transceivers on shared Vybrid channel
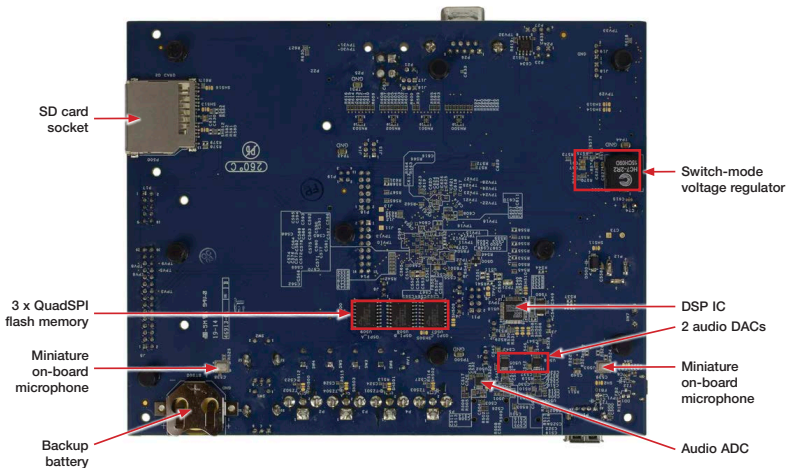
Get to Know the EVB-VF522R3 Board

Incremental encoders
Tuner switches
Aux in connector
ADC potentiometer
Aux in connector
2 headphone/audio outputs
Hole for miniature on-board microphone
Type A host USB
Radio tuner daughtercard connector
OTG Type AB USB
Hole for miniature on-board microphone
Bluetooth daughtercard header
Analog GPIO header
Digital GPIO header
Manual reset push button
External power connector
I²C daughtercard connector with 3.3 V
MAC (Ethernet daughtercard connector)
DDR3 memory
Cortex debug connector
I²C header with 5 V power
JTAG debug connector
Generic CD header
Switch-mode voltage regulator
RCON switches
Peripheral reset-control multiplexer
MLB connector
DCU daughtercard connector
LIN Molex connector
CAN header
SCI (RS232) connector

Figure 1: EVB-VF522R3 top view

4

SD card socket

Switch-mode voltage regulator

3 x QuadSPI flash memory

DSP IC

2 audio DACs

Miniature on-board microphone

Miniature on-board microphone

Backup battery

Audio ADC

Figure 2: EVB-VF522R3 bottom view

Step-by-Step Installation Instructions

This section describes how to use EVB-VF522R3 and associated components.

Caution

Daughtercards are usually not hot-swappable; ensure that the board is powered OFF prior to fitting or removing a daughtercard.

1 Download Software and Tools

Download installation software and documentation under **"Jump Start Your Design"** at **freescale.com/EVB-VF522R3**

2 Configure the Board

2.1 Insert SD Card

Insert the supplied SD card into the SD card socket of EVB-VF522R3.

2.2 Set Up Boot Switches

Verify that the switches are set to boot from the SD card per the Configuration Settings mentioned on pages 8-10.

2.3 Optional: Connect Graphical Device

Attach a compatible Graphical Device:

• An LCD daughtercard, or

• An HDMI daughtercard (and connect it to an HDMI monitor)

After boot-up, the kit SD card software outputs the OS desktop through the DCU daughtercard connector of EVB-VF522R3.

Step-by-Step Installation Instructions

2.4 Connect RS232 Cable

Connect the RS232 cable to the serial debug port of EVB-VF522R3. Support the connector with one hand while plugging in the cable to minimize flexing the board.

Serial port configuration:

- 115.2 kbaud
- 8 data bits
- 1 stop bit
- No parity
- No flow control.

2.5 Optional: Plug RF Tuner In

Plug the RF tuner (with its antenna plugged in) into the dedicated EVB-VF522R3 on-board connector.

2.6 Connect Power Supply

Plug in the provided 12 V DC supply into the power jack of EVB-VF522R3, followed by plugging the AC cord into a wall outlet.

The power-indication LEDs of EVB-VF522R3 illuminate when the system powers up properly.

2.7 Use RF Tuner

Use the RF tuner with the RS232 user interface, as well as the two incremental encoders and four station-preset buttons.

2.8 Play Audio Files

- Plug a USB Flash drive with audio files into the "Type A Host" USB connector.
- Plug headphones or active speakers into the audio output (see Figure 1).
- Select and play an audio file using either a touchscreen of the optional LCD with incremental encoders, or the RS232 user interface.

EVB-VF522R3 Configuration Settings

The following is a list of the configuration settings on the EVB-VF522R3. The default settings are shown in the gray boxes.

Device	Function	Setting	Legend	Description
J1	"AUDIO IN" ADC routing	1–2	1	To MCU
		2–3	3	To DSP
		Removed	——	To none
J2	DSP mode of operation	1–2	1	Slave (from MCU)
		2–3	3	Master (from SPI Serial Flash)
J3	DSP Flash "Chip Enable" control	1–2	1	By MCU (for DSP Slave mode)
		2–3	3	By DSP and DSP debug header (for Master mode)
J4*	MCU USB0 PHY power source	1–2	1	Self–powered
		2–3	3	Bus–powered (from P9)
		Removed	——	Unpowered
J6	Optional 1.2 V linear regulator output control	Removed		Enabled
		Fitted		Disabled
J7*	MCU USB1 PHY power control	Fitted		Powered
		Removed		Unpowered
J8	MCU VBAT power source	1–2	1	From main MCU 3.3 V rail
		2–3	3	From backup battery
		Removed	——	Unpowered

Notes:
  * Can be used for current measurements if replaced with a current measuring device.
  ** Can be used for current measurements if replaced with a current-sense resistor.

EVB-MPC5322R3 Configuration Settings

Device	Function	Setting		Legend	Description
J9*	Main 3.3 V power for MCU	Fitted		—	Provided
		(Removed)			(Not recommended)
J14, J15	MCU Boot Mode	J15 (MOD[1])	J14 (MOD[0])	BOOTMOD [1..0]	Boot Mode
		1–2 (Low)	1–2 (Low)	00	Internal fuses
		1–2 (Low)	2–3 (High)	01	Serial Download
		2–3 (High)	1–2 (Low)	10	RCON switches
		2–3 (High)	2–3 (High)	11	(Reserved)
J16, J17	Transceiver selected	1–2		1/SCI	SCI (RS232)
		2–3		3/LIN	LIN
		Removed		—	None selected
J18, J19	Interface selected	1–2		1	Touchscreen
		2–3		3	I²C
		Removed		—	None selected
P21	LIN interface power source	Removed		—	From Molex connector
		Fitted			Local
P23	CAN termination control	Removed		—	OFF
		Fitted			ON
P24	Power from EVB over CAN cable	Removed		—	OFF
		Fitted			ON

Notes:
 * Can be used for current measurements if replaced with a current measuring device.
 ** Can be used for current measurements if replaced with a current-sense resistor.

EVB-VF522R3 Configuration Settings

Device	Function	Setting	Legend	Description
R28	MCU core ballast transistor collector voltage	**A**	───	**1.5 V**
		B		3.3 V
R79	LIN interface mode of operation	**Populated**	───	**Master**
		Removed		Slave
R621	MCU 24 MHz clock source	**A**	───	**MCU crystal oscillator**
		B		External oscillator IC
R625**	MCU analog 1.2 V power source	**A**	───	**From main MCU 1.2 V power rail**
		B		From linear 1.2 V regulator
R632**, FB504**	MCU analog 3.3 V power source	**FB504**	───	**From main MCU 3.3 V power rail**
		R632		From linear 3.3 V regulator
SW8	MCU RCON (reset configuration)	12345678	**ON** ⬆	**"RCON Switches" MCU Boot Mode (ignored in all other MCU Boot Modes)**
SW9		12345678		
SW10		12345678		
SW11		12345678		

Notes:
 * Can be used for current measurements if replaced with a current measuring device.
 ** Can be used for current measurements if replaced with a current-sense resistor.

EVB-VF522R3 Jumper Map
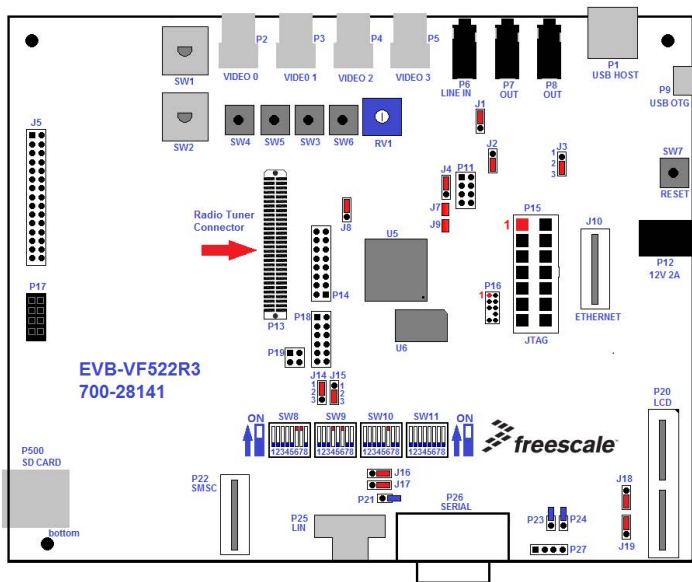
■ **Default Jumper Setting**

Support

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

Warranty

Visit **freescale.com/warranty** for complete warranty information.

For more information, visit
freescale.com/EVB-VF522R3 or
freescale.com/Vybrid

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