



# EVB-VF522R3

## Quick Start Guide

EVB-VF522R3

Evaluation Platform for the  
Vybrid R Series Products used  
in Automotive Applications



## Automotive 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.



## CVB-VF02R3 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 I<sup>2</sup>C 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
- I<sup>2</sup>C header for custom-made daughtercard powered from 3.3 V
- I<sup>2</sup>C header for daughtercard powered from 5 V
- Bluetooth daughtercard header
- MLB daughtercard connector
- Board-to-Board connector bearing one 10/100 Mbit/s RMI 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

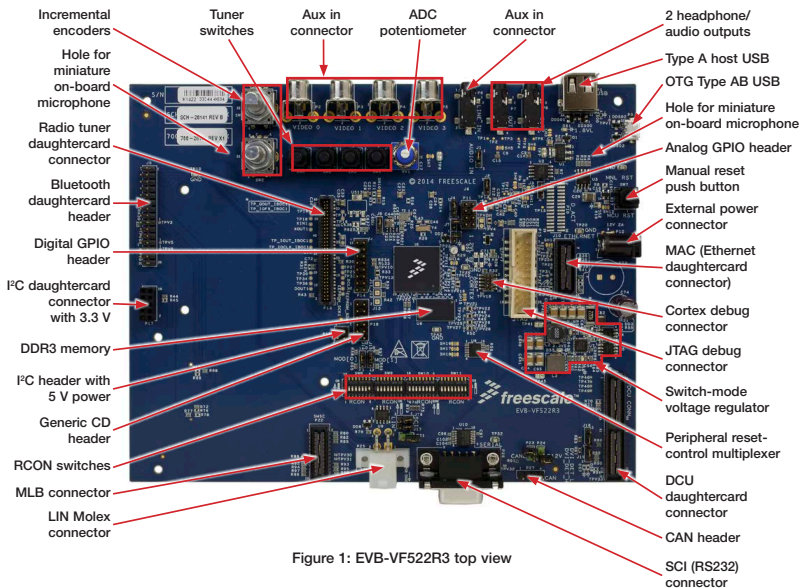


Figure 1: EVB-VF522R3 top view

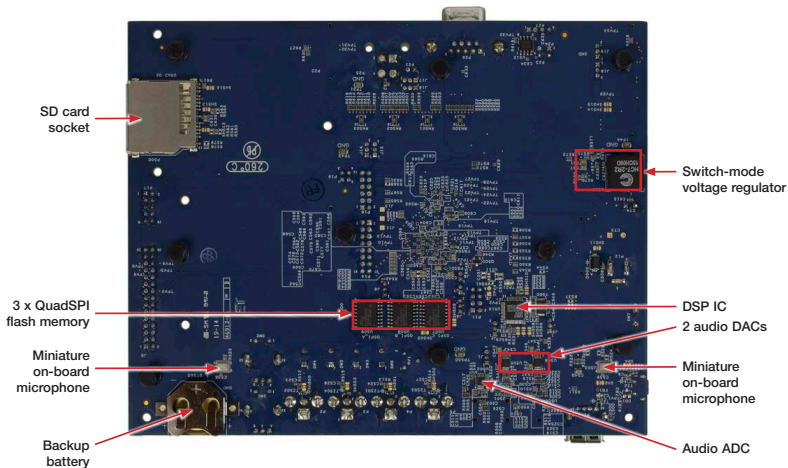


Figure 2: EVB-VF522R3 bottom view

## 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](http://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.



## 3-step-by-3-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.



## LVD-V1 J2R3 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	<b>J15 (MOD[1])</b>	<b>J14 (MOD[0])</b>	<b>BOOTMOD [1..0]</b>	<b>Boot Mode</b>
		1-2 (Low)	1-2 (Low)	00	Internal fuses
		1-2 (Low)	2-3 (High)	01	Serial Download
		<b>2-3 (High)</b>	<b>1-2 (Low)</b>	<b>10</b>	<b>RCON switches</b>
		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	I <sup>2</sup> C
		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.

## CVD-VF02R3 Configuration Settings

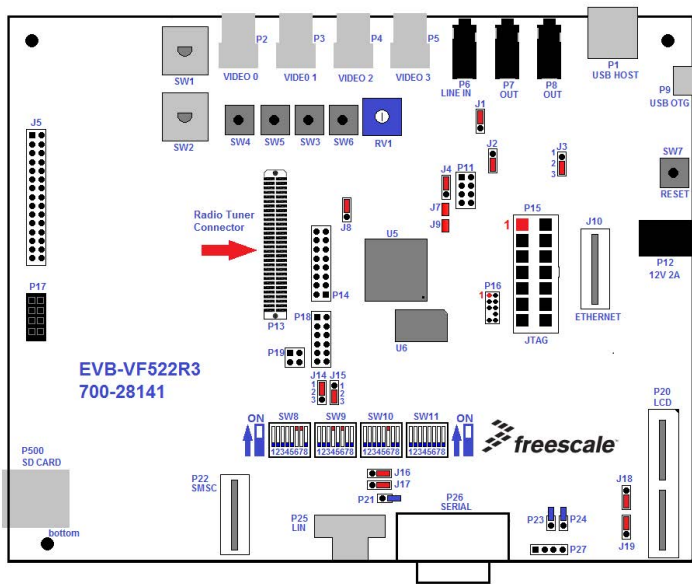
Device	Function	Setting	Legend	Description
R28	MCU core ballast transistor collector voltage	A	—	1.5 V
		B		3.3 V
R79	LIN interface mode of operation	Populated	—	Master
		Removed		Slave
R621	MCU 24 MHz clock source	A	—	MCU crystal oscillator
		B		External oscillator IC
R625**	MCU analog 1.2 V power source	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)			"RCON Switches" MCU Boot Mode (ignored in all other MCU Boot Modes)
SW9				
SW10				
SW11				

### 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





## Support

Visit [freescale.com/support](http://freescale.com/support) for a list of phone numbers within your region.

## Warranty

Visit [freescale.com/warranty](http://freescale.com/warranty) for complete warranty information.

For more information, visit  
[freescale.com/EVB-VF522R3](http://freescale.com/EVB-VF522R3) or  
[freescale.com/Vybrid](http://freescale.com/Vybrid)

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