



**THE DATASHEET OF
SN65LVP17EVM**



Translator/Oscillator Buffer ***Evaluation Module***

User's Guide

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265

EVM IMPORTANT NOTICE

Texas Instruments (TI) provides the enclosed product(s) under the following conditions:

This evaluation kit being sold by TI is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not considered by TI to be fit for commercial use. As such, the goods being provided may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including product safety measures typically found in the end product incorporating the goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may not meet the technical requirements of the directive.

Should this evaluation kit not meet the specifications indicated in the EVM User's Guide, the kit may be returned within 30 days from the date of delivery for a full refund. **THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.**

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user indemnifies TI from all claims arising from the handling or use of the goods. Please be aware that the products received may not be regulatory compliant or agency certified (FCC, UL, CE, etc.). Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge.

EXCEPT TO THE EXTENT OF THE INDEMNITY SET FORTH ABOVE, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

TI currently deals with a variety of customers for products, and therefore our arrangement with the user **is not exclusive**.

TI assumes **no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein**.

Please read the EVM User's Guide and, specifically, the EVM Warnings and Restrictions notice in the EVM User's Guide prior to handling the product. This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact the TI application engineer.

Persons handling the product must have electronics training and observe good laboratory practice standards.

No license is granted under any patent right or other intellectual property right of TI covering or relating to any machine, process, or combination in which such TI products or services might be or are used.

Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265

EVM WARNINGS AND RESTRICTIONS

It is important to operate this EVM within the supply voltage range of 3 V to 3.6 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 125°C. The EVM is designed to operate properly with certain components above 125°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265

Read This First

About This Manual

This EVM user's guide provides information about the translator/oscillator buffer evaluation module.

How to Use This Manual

This document contains the following chapters:

- Chapter 1 — Introduction
- Chapter2 — Bills of Materials and Schematic

Information About Cautions and Warnings

This book may contain cautions and warnings.

This is an example of a caution statement.

A caution statement describes a situation that could potentially damage your software or equipment.

This is an example of a warning statement.

A warning statement describes a situation that could potentially cause harm to you.

The information in a caution or a warning is provided for your protection. Please read each caution and warning carefully.

Related Documentation From Texas Instruments

To obtain a copy of any of the following TI document, call the Texas Instruments Literature Response Center at (800) 477-8924 or the Product Information

Center (PIC) at (972) 644–5580. When ordering, identify this booklet by its title and literature number. Updated documents can also be obtained through our website at www.ti.com.

Data Sheet:	Literature Number:
SN65LVDS16/17/SN65LVP16/17	SLLS625
SN65LVDS18/19/SN65LVP18/19	SLLS624
SN65LVDS20/SN65LVP20	SLLS620

FCC Warning

This equipment is intended for use in a laboratory test environment only. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment in other environments may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

Contents

1	Introduction	1-1
1.1	Evaluation Module U1	1-2
1.2	Applying an Input to EVM U1	1-2
1.3	Observing an EVM U1 Output	1-3
1.4	Evaluation Module U2	1-4
1.5	Applying an Input to EVM U2	1-4
1.6	Observing an EVM U2 Output	1-5
2	Bill of Materials and Schematic	2-1
2.1	Bill of Materials	2-2
2.2	Schematic	2-3

Figures

1-1	Power Connections for Evaluation Module U1	1-2
1-2	Power Connections for Evaluation Module U2	1-4

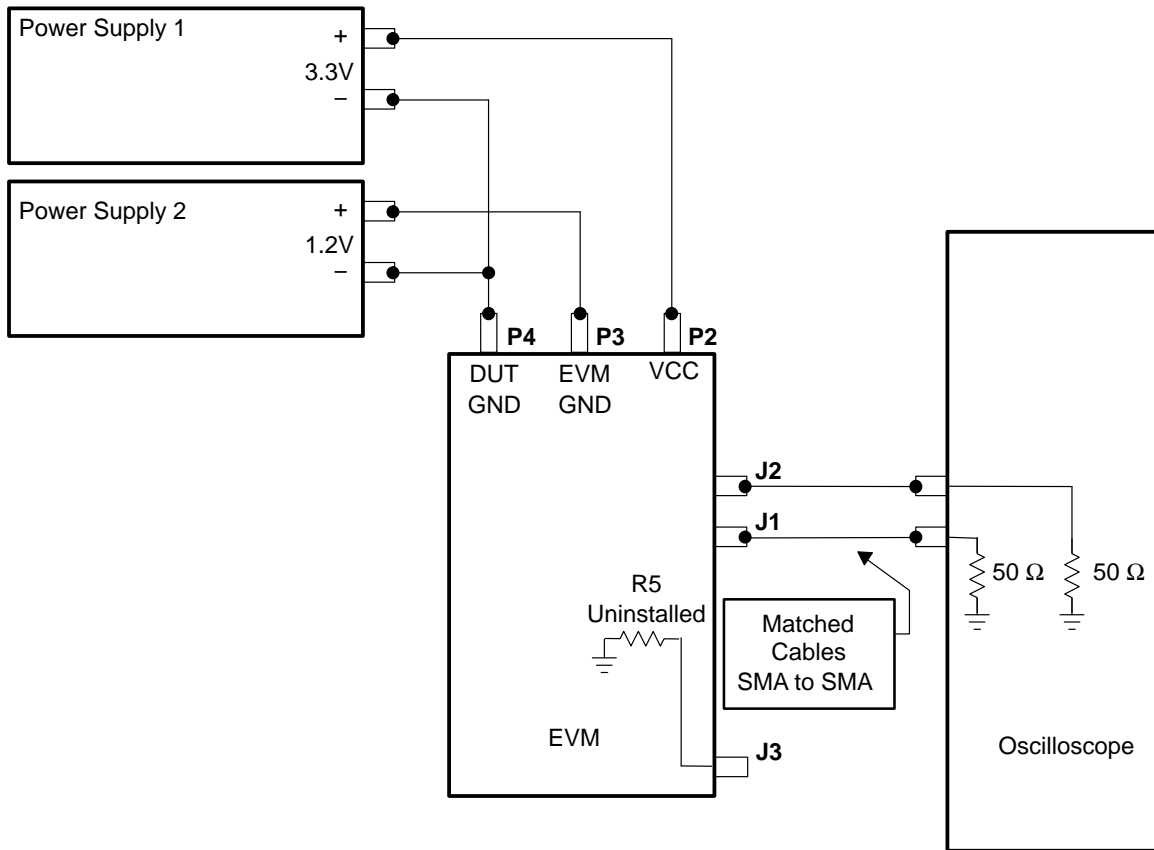
Introduction

The translator/oscillator buffer evaluation module (EVM) allows evaluation of the SN65LVDS16/17/18/19/20 and SN65LVP16/17/18/19/20 repeaters/translators/oscillators. This user's guide provides a brief overview of the EVM, operation instructions, and output results.

Topic	Page
1.1 Evaluation Module U1	1-2
1.2 Applying an Input to EVM U1	1-2
1.3 Observing an EVM U1 Output	1-3
1.4 Evaluation Module U2	1-4
1.5 Applying an Input to EVM U2	1-4
1.6 Observing an EVM U2 Output	1-5

1.1 Evaluation Module U1

Figure 1–1. Power Connections for Evaluation Module U1



Warning

Power jacks P2, P3, and P4 are not insulated on the backside of the EVM. Place the EVM on a nonconductive surface.

1.2 Applying an Input to EVM U1

For the oscillator gain stage/buffer the only requirement is to simply apply power to the EVM. The EVM has a crystal onboard that when powered up supplies a signal to the SN65LVDS16, SN65LVP16, SN65LVDS18, or SN65LVP18 which provides a very clean 155.52 MHz signal at J1 and J2.

1.3 Observing an EVM U1 Output

The outputs are available at J1 and J2 for direct connection to oscilloscope inputs. Matched length cables must be used when connecting the EVM to a scope to avoid inducing skew between the noninverting (+) and inverting (–) outputs.

The three power jacks (P2, P3, and P4) are used to provide power and a ground reference for the EVM. The power connections to the EVM determine the common-mode load to the device. When connecting the EVM outputs directly to oscilloscope inputs, setting of the oscilloscope common-mode offset voltage is required, as the oscilloscope presents low common-mode load impedance to the device.

Returning to Figure 1–1, Power Supply 1 is used to provide the required 3.3 V to the EVM. Power Supply 2 is used to offset the EVM ground relative to the DUT ground. The EVM ground is connected to the oscilloscope ground through the returns on SMA connectors J1 and J2. With power applied, the common-mode voltage seen by the SN65LVDS16 or SN65LVDS18 is approximately equal to the reference voltage being used inside the device preventing significant common-mode current to flow. Optimum device setup can be confirmed by adjusting the voltage on Power Supply 2 until its current is minimized. It is important to note that use of the dual supplies, and offsetting the EVM ground relative to the DUT ground are simply steps needed for test and evaluation of devices. Actual designs would include high-impedance receivers, which would not require the setup steps outlined above.

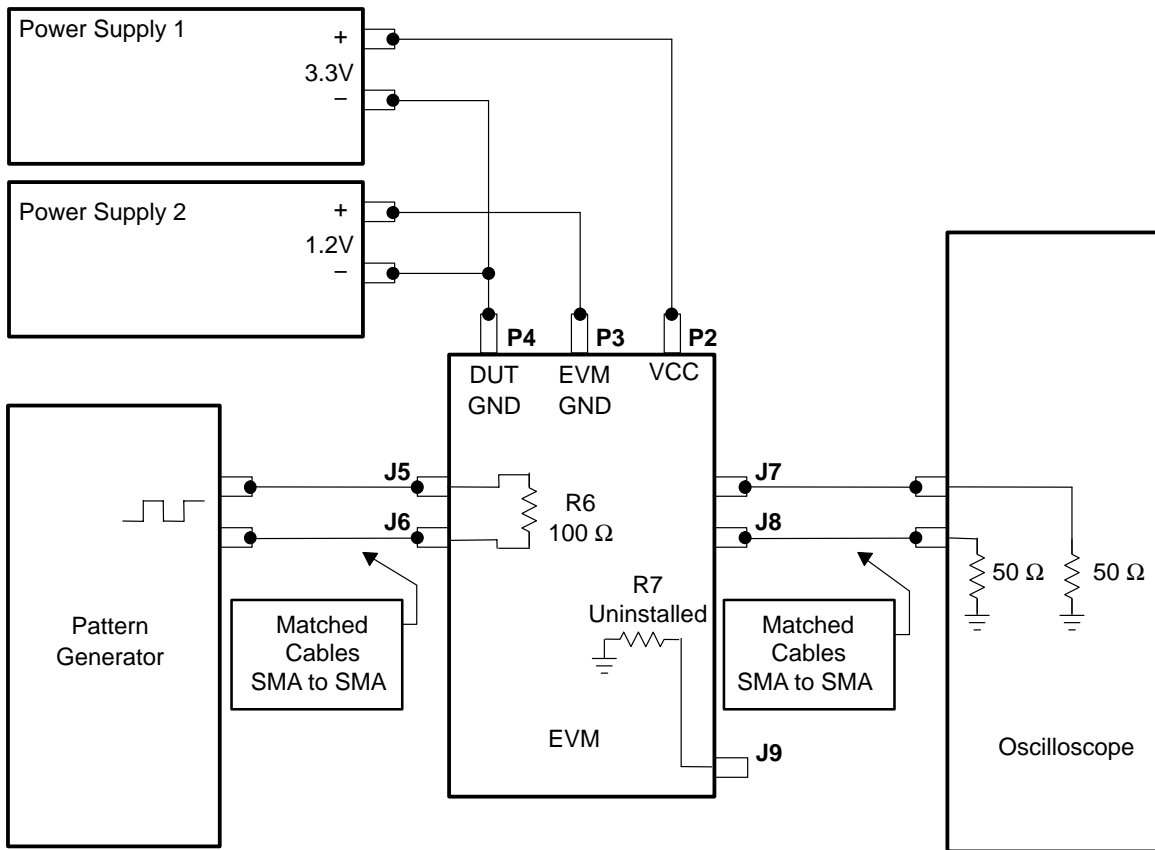
LVPECL drivers need a 50- Ω termination to V_{TT} . A modification of Figure 1–1 and the above instructions are used when evaluating a SN65LVP16 or SN65LVP18 with a direct connection to a 50- Ω oscilloscope. With Power Supply 1 in Figure 1–1 set to 3.3 V, Power Supply 2 should be set to 1.3 V (2 V below V_{CC}) to provide the correct termination voltage.

Note:

Power Supply 2 must be able to sink current.

1.4 Evaluation Module U2

Figure 1–2. Power Connections for Evaluation Module U2



Warning

Power jacks P2, P3, and P4 are not insulated on the backside of the EVM. Place the EVM on a nonconductive surface.

1.5 Applying an Input to EVM U2

Inputs should be applied to SMA connectors J5 and J6, while keeping R6 installed. The EVM comes with a 100- Ω termination resistor (R6) installed across the differential inputs for terminating the transmission line.

When using a general-purpose signal generator with 50- Ω output impedance, make sure that the signal levels are between 0 V to V_{CC} with respect to P4. V_{ID} cannot exceed 2 V. A signal generator such as the Advantest D3186 can simulate LVPECL, LVDS, or CML inputs.

LVPECL levels can be obtained with 100- Ω differential input termination by setting the input generator to a common-mode of 0.7 V.

1.6 Observing an EVM U2 Output

The outputs are available at J8 and J7 for direct connection to oscilloscope inputs. Matched length cables must be used when connecting the EVM to a scope to avoid inducing skew between the noninverting (+) and inverting (-) outputs.

The three power jacks (P2, P3, and P4) are used to provide power and a ground reference for the EVM. The power connections to the EVM determine the common-mode load to the device. When connecting the EVM outputs directly to oscilloscope inputs, setting of the oscilloscope common-mode offset voltage is required, as the oscilloscope presents low common-mode load impedance to the device.

Returning to Figure 1–2, Power Supply 1 is used to provide the required 3.3 V to the EVM. Power Supply 2 is used to offset the EVM ground relative to the DUT ground. The EVM ground is connected to the oscilloscope ground through the returns on SMA connectors J8 and J7. With power applied, the common-mode voltage seen by the SN65LVDS20, SN65LVDS17, or SN65LVDS19 is approximately equal to the reference voltage being used inside the device preventing significant common-mode current to flow. Optimum device setup can be confirmed by adjusting the voltage on Power Supply 2 until its current is minimized. It is important to note that use of the dual supplies, and offsetting the EVM ground relative to the DUT ground are simply steps needed for test and evaluation of devices. Actual designs would include high-impedance receivers, which would not require the setup steps outlined above.

LVPECL drivers need a 50- Ω termination to V_{TT} . A modification of Figure 1–1 and the above instructions are used when evaluating a SN65LVP20, SN65LVP17, or SN65LVP19 with a direct connection to a 50- Ω oscilloscope. With Power Supply 1 in Figure 1–2 set to 3.3 V, Power Supply 2 should be set to 1.3 V (2 V below V_{CC}) to provide the correct termination voltage.

Note:

Power Supply 2 must be able to sink current.



Bill of Materials and Schematic

This chapter contains the bill of materials and schematic.

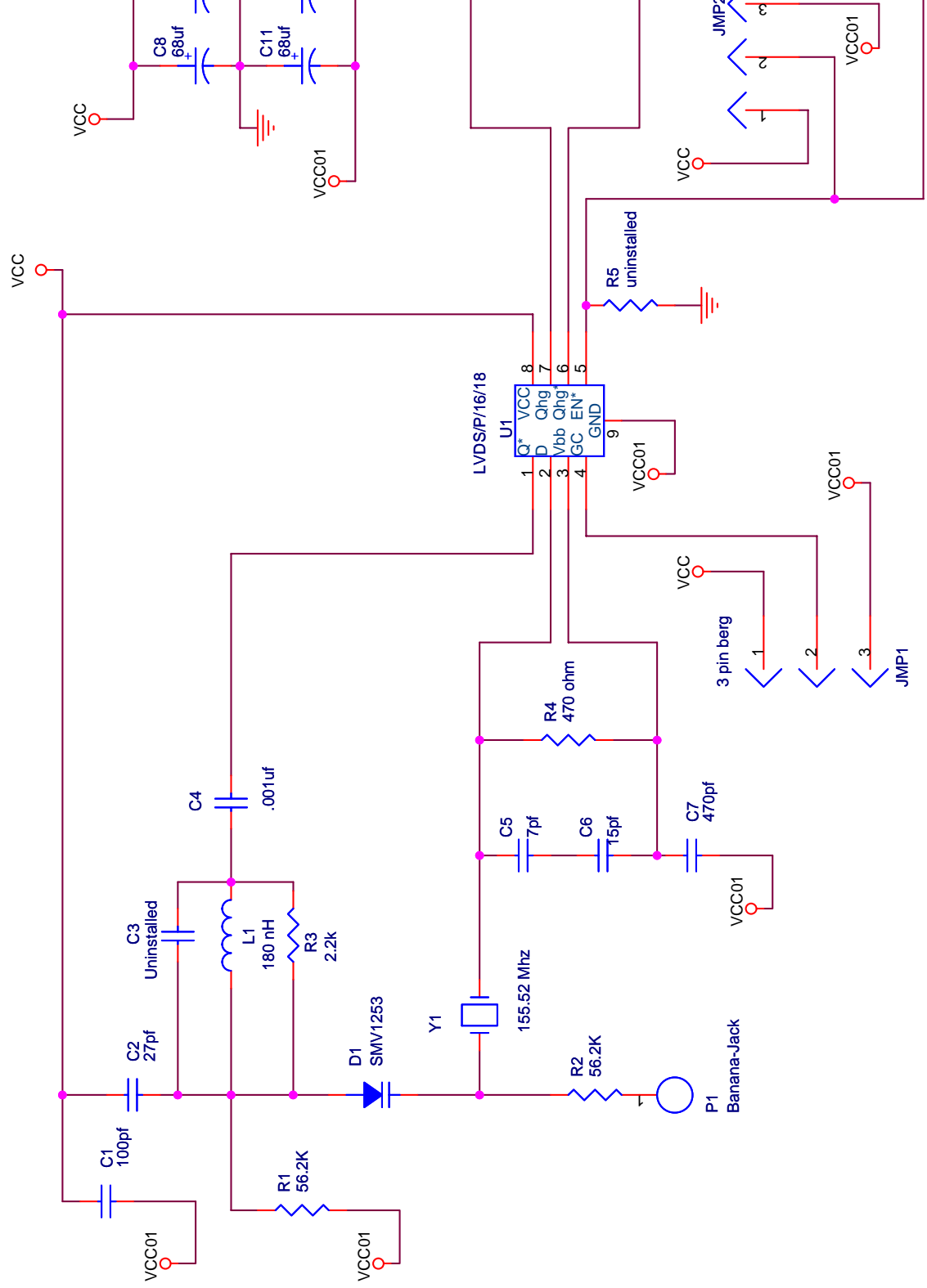
Topic	Page
2.1 Bill of Materials	2-2
2.2 Schematic	2-3

2.1 Bill of Materials

Item	Quantity -1	Quantity -2	Reference	Value	Part No.
1	1	-	C1	0.01 μ F	ECJ-1VB1H103K
2	1	-	C2	27 pF	ECJ-OEC1H270J
3	1	-	C3	Uninstalled	Uninstalled
4	1	-	C4	0.001 μ F	ECJ-OEB1H102K
5	1	-	C5	7 pF	ECJ-OEC1H070D
6	1	-	C6	15 pF	ECJ-OEC1H150J
7	1	-	C7	470 pF	ECJ-OEB1H471K
8	2	2	C8, C11	68 μ F	592D686X0010R2T
9	2	2	C9, C12	10 μ F	293D106X0035D2W
10	2	2	C10, C13	1 μ F	12063G105ZATRA
11	-	1	C14	0.01 μ F	ECJ-OEB1E103K
12	1	-	D1	SMV1253	SMV1253-079 Skyworks Solutions Inc.
13	1	1	JMP1, JMP3		3 Pin berg (Make from AMP 4-103239-0)
14	1	1	JMP2, JMP4		4 Pin berg (Make from AMP 4-103239-0)
15	3	5	J1, J2, J3, J4, J5, J6, J7, J8, J9	SMA	142-0701-801
16	1	-	L1	180 nH	ELJ-RER18JF3
17	4	4	P1, P2, P3, P4	Banana-jack	3267
18	2	-	R1, R2	56.2 k Ω	ERJ-2RKF5622X
19	1	-	R3	2.21 k Ω	ERJ-2RKF2211X
20	1	-	R4	470 Ω	ERJ-2RKF4700X
21	1	1	R5, R7	49.9 Ω	ERJ-3EKF49R9V (Uninstalled)
22	-	1	R6	100 Ω	ERJ-2RKF1000X
23	1	-	U1	LVP/16/18	SN65LVDS/P16/18
24	-	1	U2	LVDS/P	SN65LVDS/P/17/19/20
25	1	-	Y1	155.52 MHz	CWI45-B Conner-Winfield Corp.
26	4	4	NA	Rubber feet	SJ5303-7-ND
27	1	1	NA	PWB	6464145

2.2 Schematic

The schematic for this device is attached.



Title	Size	Date:
LVDS/P/16/17/18/19/20 EV	A	Friday, August 27, 2004

Document Number
6464145

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View SN65LVP17EVM on WIN SOURCE](#)

 [Texas Instruments](#) Information

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management