



3.125 Gbps 2x2 LVDS Crosspoint Switch with Transmit Pre-emphasis and Receive Equalization

DS25CP102 Evaluation Kit

USER MANUAL

Part Number: DS25CP102EVK NOPB

For the latest documents concerning these products and evaluation kit, visit lvds.national.com.
Schematics and gerber files are also available at lvds.national.com.

Table of Contents

Table of Contents	2
Overview	3
Description.....	4
Evaluation.....	5
Switch Configuration Truth Tables	6
Typical Performance	7

Overview

The DS25CP102EVK is an evaluation kit designed for demonstrating performance of the DS25CP102, a 3.125 Gbps 2x2 LVDS Crosspoint Switch with transmit pre-emphasis and receive equalization. The evaluation kit is comprised of the DS25CP102 with its associated input and output SMA connectors and jumpers to manually configure the switch. In addition, the EVJ features three FR4 striplines (14 (~35), 28 (~75) and 42 (~105) inches (cm) in length) for exercising device's signal conditioning features (pre-emphasis and equalization).

The purpose of this document is to familiarize the user with the DS25CP102EVK, to suggest test setup procedures and instrumentation to test the device optimally, and to guide the user through some typical measurements that demonstrate the performance of the DS25CP102 in typical applications.

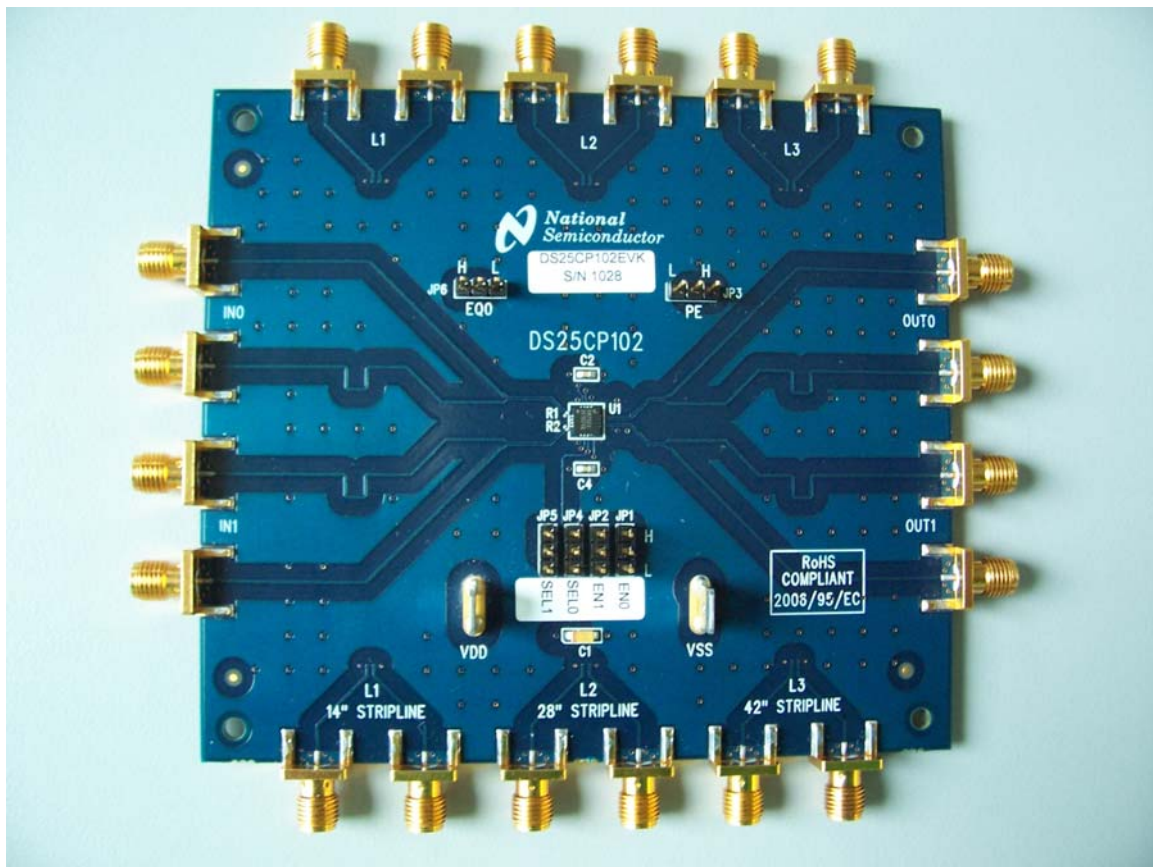


Figure 1. Photo of the DS25CP102EVK

Description

Figure 2 shows the top layer drawing of the PCB with the silkscreen annotations. The 4.5 by 4.0 inch, four-layer PCB is designed to evaluate the functions of the DS25CP102.

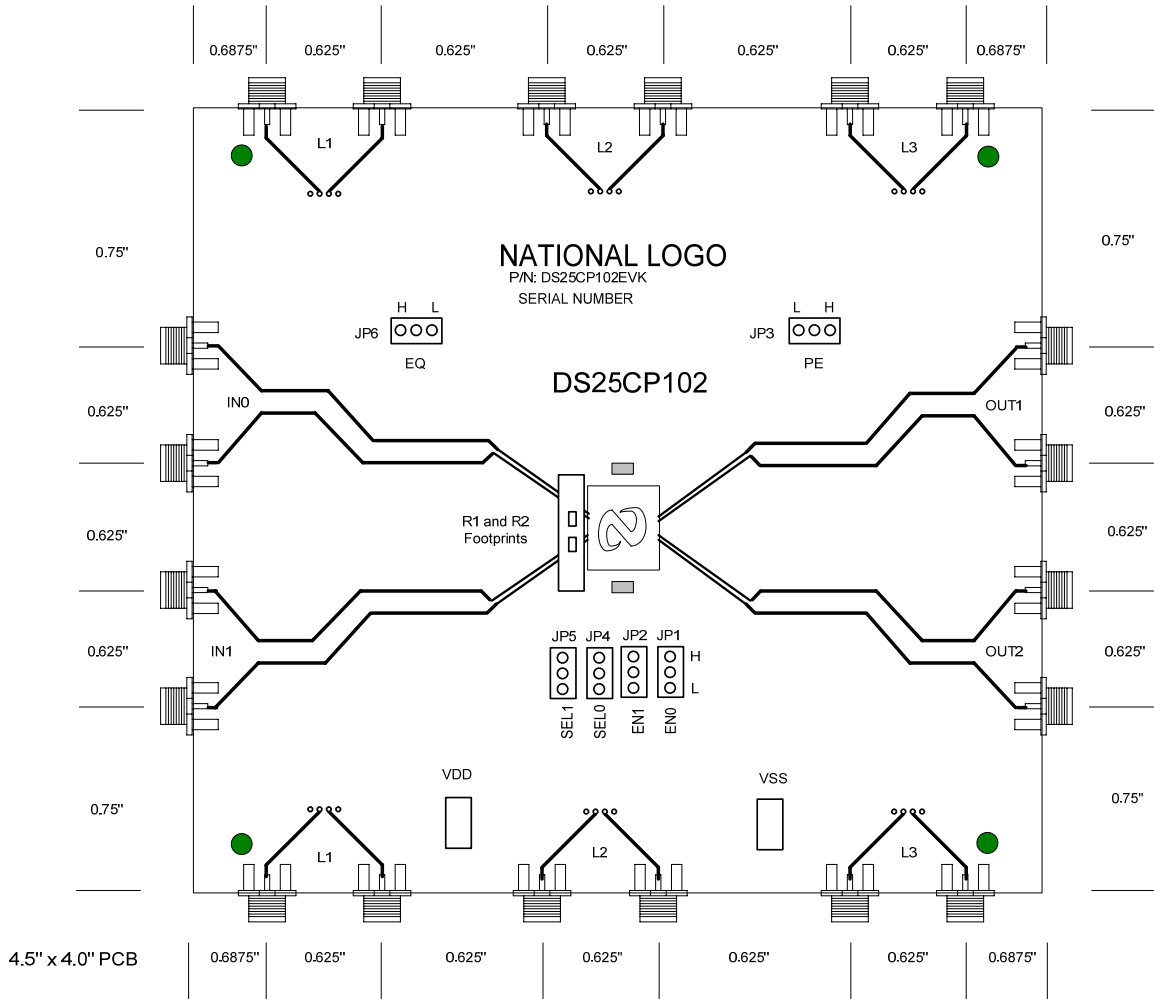


Figure 2. Top Layer DS25CP102EVK

Evaluation

This section provides recommended test setup procedure for the device evaluation. Figure 3 depicts a typical setup and instrumentation you may use for the device evaluation.

1. Configure the test setup as shown in Figure 3.
2. Set and enable the desired INn to OUTn drivers by selecting SEL0, SEL1, EN0 and EN1 according to Tables 1 – 2.
3. Apply + supply (3.3V typical) to the VDD and – supply (ground) to the VSS connectors.
4. Set desired pre-emphasis and/or equalization levels according to Tables 3 – 4.
5. Connect a signal source (signal generator, data source, or an LVDS driver) to the desired INn inputs on the board and adjust the signal parameters (VOH, VOL, VCM) so that they comply with the device input recommendations.
6. Connect an oscilloscope to the selected OUTn outputs and view the output signals with an oscilloscope with the analog bandwidth of at least 5 GHz.

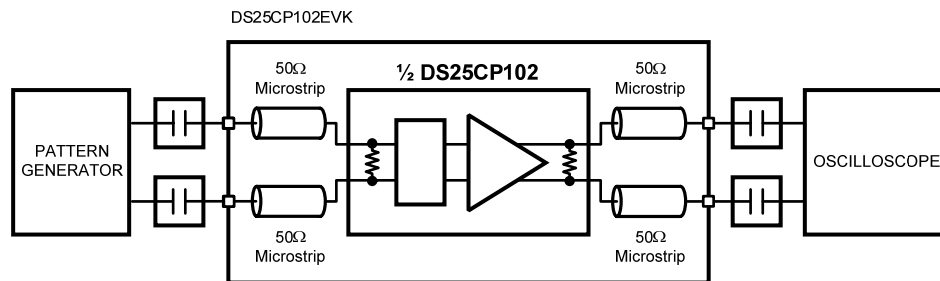


Figure 3. DS25CP102 Test Setup Example

Switch Configuration Truth Tables

SEL1	SEL0	OUT1	OUT0
0	0	IN0	IN0
0	1	IN0	IN1
1	0	IN1	IN0
1	1	IN1	IN1

Table 1. Switch Configuration Truth Table

EN1	EN0	OUT1	OUT0
0	0	Disabled	Disabled
0	1	Disabled	Enabled
1	0	Enabled	Disabled
1	1	Enabled	Enabled

Table 2. Output Enable Truth Table

OUTPUTS OUT0 and OUT1	
CONTROL Pin PE State	Pre-emphasis Level
0	OFF
1	ON

Table 3. Transmit Pre-emphasis Truth Table

OUTPUTS OUT0 and OUT1	
CONTROL Pin PE State	Pre-emphasis Level
0	OFF
1	ON

Table 4. Receive Equalization Truth Table

Typical Performance

This section of the User Manual shows a typical eye diagram you can expect to see when evaluating the DS25CP102EVK.

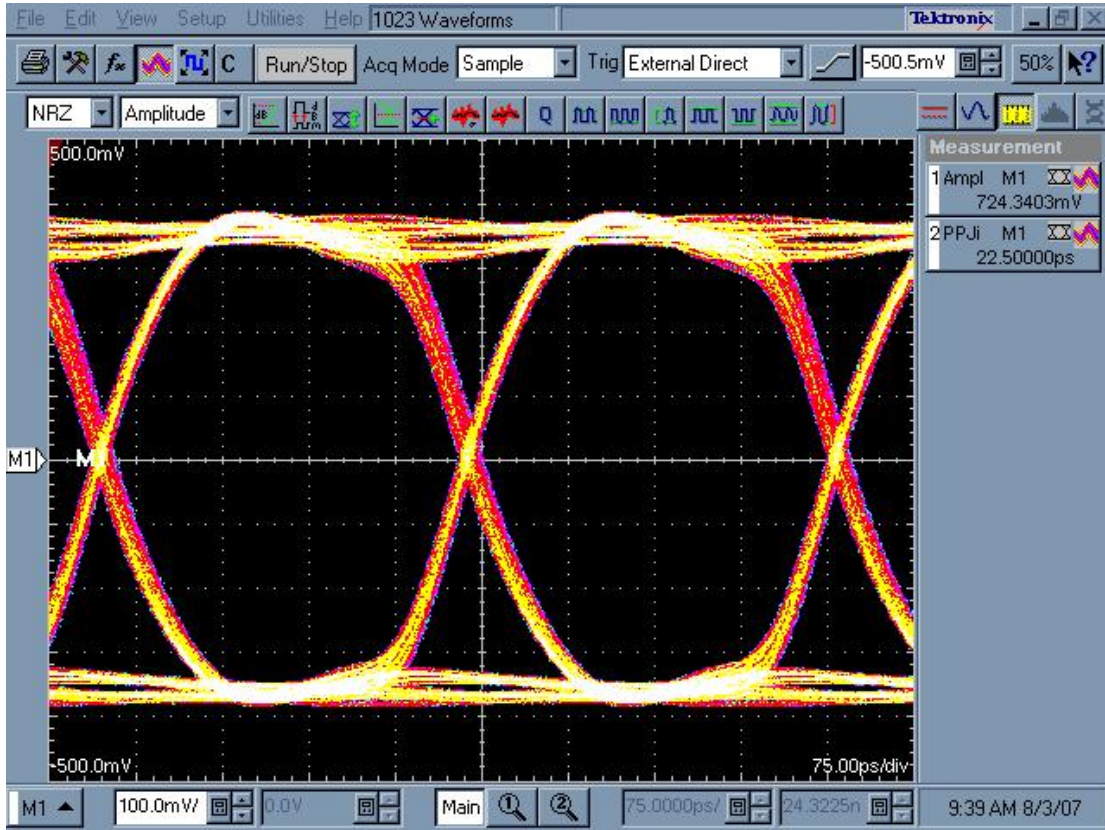
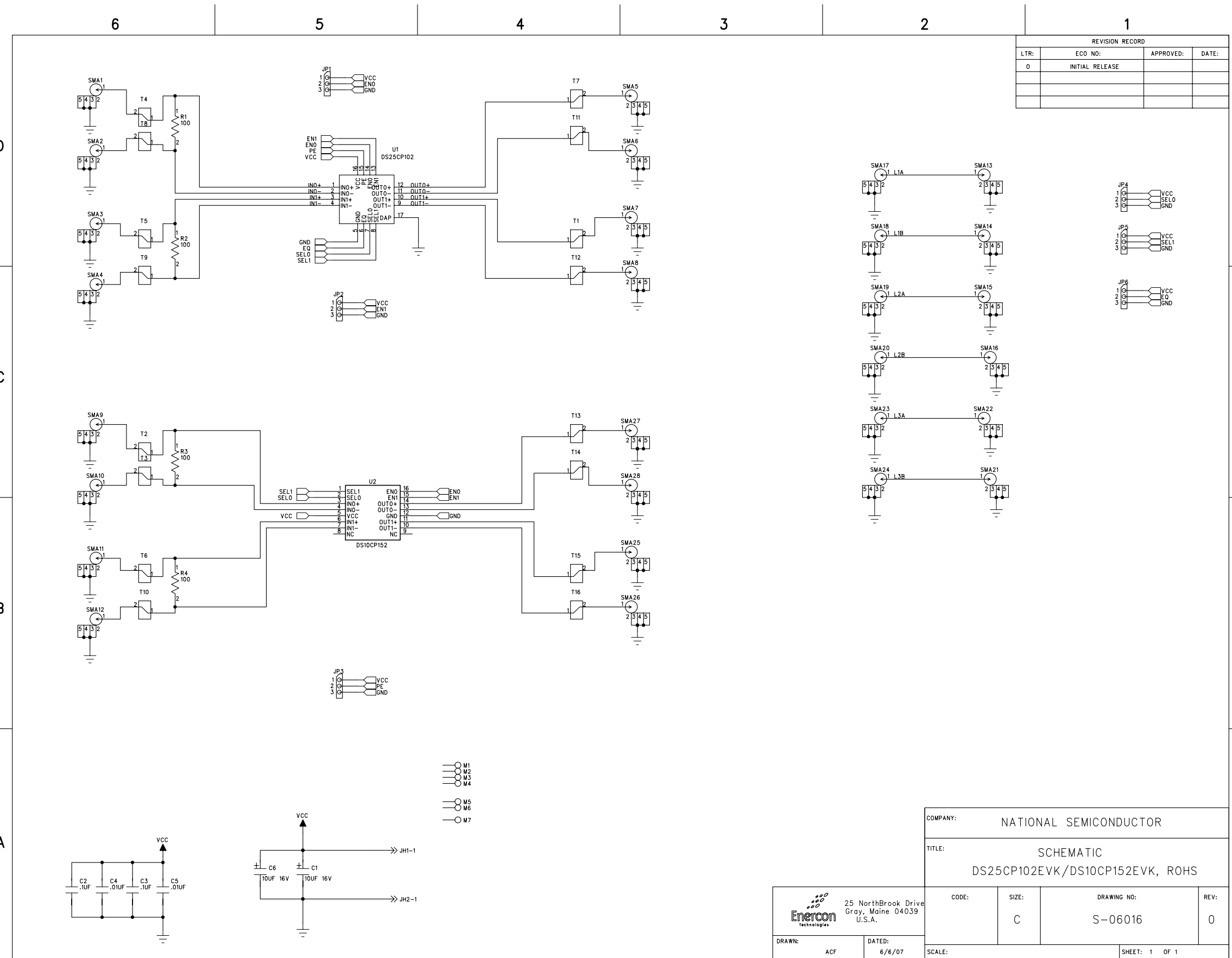
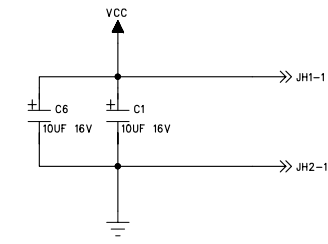
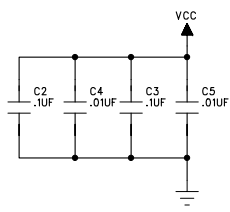
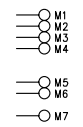
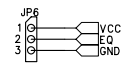
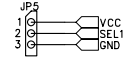
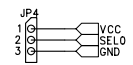


Figure 4. DS25CP102 3.125 Gbps NRZ PRBS-7 Output Eye Diagram



REVISION RECORD			
LTR:	ECO NO:	APPROVED:	DATE:
0	INITIAL RELEASE		



COMPANY: NATIONAL SEMICONDUCTOR			
TITLE: SCHEMATIC DS25CP102EVK/DS10CP152EVK, ROHS			
CODE:	SIZE: C	DRAWING NO: S-06016	REV: 0
DRAWN: ACF		DATED: 6/6/07	
SCALE:		SHEET: 1 OF 1	

25 NorthBrook Drive
 Gray, Maine 04039
 U.S.A.
 DRAWN: ACF DATED: 6/6/07

ENERCON - BILL OF MATERIALS	TITLE:	NATIONAL SEMICONDUCTOR PCBA, DS25CP102EVK, ROHS	PL Number: Z3102-01	Rev: 1	Rev By: AF	Rev Date: 10/9/2007	PL Status: Released
	Main Product: PCBA, DS25CP102EVK		Responsible Eng/Mgr:		Creator: Arlene Fox	Creation Date: 6/7/2007	

Item	Part Type	Part Number/Value	Mfg	NoSub	Description	Qty	SMT	Ref Des	Notes	Rev
1	PCB	P-06015R1	ENERCON		DS25CP102: 4.00x4.50x.060in, 8 layer	1			Bd: (101.60x 114.30mm) Panel: (4.50x 8.10in) (114.30x205.74mm) 2 bds/panel	1
2										
3	IC	DS25CP102TSQ	NAT		3.125 Gbps LVDS Crosspoint Switch, LLP16, Pb-Free	1	X	U1	Customer Supplied	0
4										
5	CAP	06035C103KAT	AVX		.01µF, 50V, ±10%, 0603, Ceramic, X7R, Pb-Free	1	X	C4		0
	<ALT>	C0603C103K5RAC	KEMET		.01µF, 50V, ±10%, 0603, Ceramic, X7R, Pb-Free					
	<ALT>	ECJ-1VB1H103K	PANA		.01µF, 50V, ±10%, 0603, Ceramic, X7R, Pb-Free					
6	CAP	0603YC104KAT	AVX		.1µF, 16V, ±10%, 0603, Ceramic, X7R, Pb- Free	1	X	C2		0
	<ALT>	C0603C104K4RAC	KEMET		.1µF, 16V, ±10%, 0603, Ceramic, X7R, Pb- Free					
	<ALT>	ECJ-1VB1C104K	PANA		.1µF, 16V, ±10%, 0603, Ceramic, X7R, Pb- Free					
7	CAP	TAJA106K016	AVX		10µF, 16V, ±10%, A-Case, Tantalum, Pb- Free	1	X	C1		0
	<ALT>	T491A106K016AT	KEMET		10µF, 16V, ±10%, A-Case, Tantalum, Pb- Free					
8										
9	CONN	1287	KEYSTONE		Faston, Male, .250", Pb-Free	2		JH1-2	VDD, VSS	0
10	CONN	142-0701-851	EMERSON		SMA, Jack Receptacle, 50 OHM, Pb-Free	20		SMA1-8,13-24		0
11	CONN	TSW-103-07-G-S	SAMTEC		Header, 3p, Male, .100"sp, Gold, Pb-Free	6		JP1-6		0
12										
13	STENCL	T-06019R0	ENERCON		STENCIL FABRICATION, TOP, DS25CP102/DS10CP152EVK	1				0
14										
15	REF	C-06017R1	ENERCON		FABRICATION DWG, DS25CP102/DS10CP152EVK					1

ENERCON - BILL OF MATERIALS	TITLE: NATIONAL SEMICONDUCTOR PCBA, DS25CP102EVK, ROHS	PL Number: Z3102-01	Rev: 1	Rev By: AF	Rev Date: 10/9/2007	PL Status: Released
		Responsible Eng/Mgr: Arlene Fox		Creator: Arlene Fox		Creation Date: 6/7/2007
Main Product: PCBA, DS25CP102EVK						

Item	Part Type	Part Number/Value	Mfg	NoSub	Description	Qty	SMT	Ref Des	Notes	Rev
16	REF	C-06018R0	ENERCON		PALLET DWG, DS25CP102/DS10CP152EVK					0
17	REF	S-06016R0	ENERCON		SCHEMATIC, DS25CP102/DS10CP152EVK					0
18										
19										

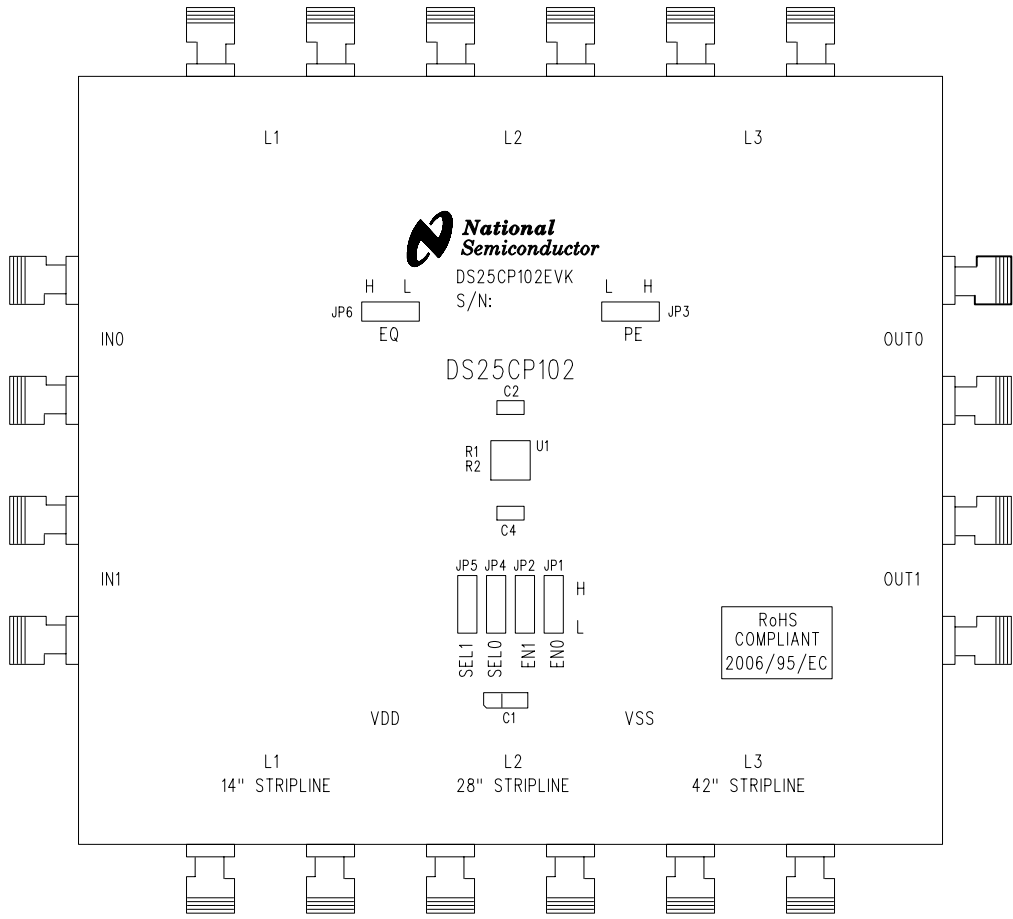
Notes:

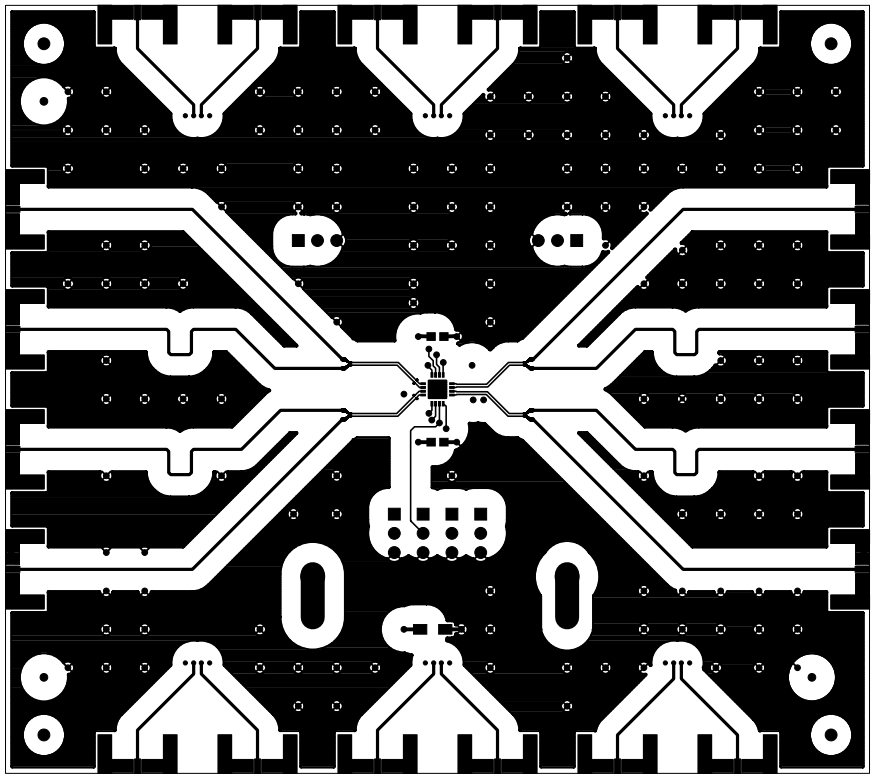
DO NOT STUFF:

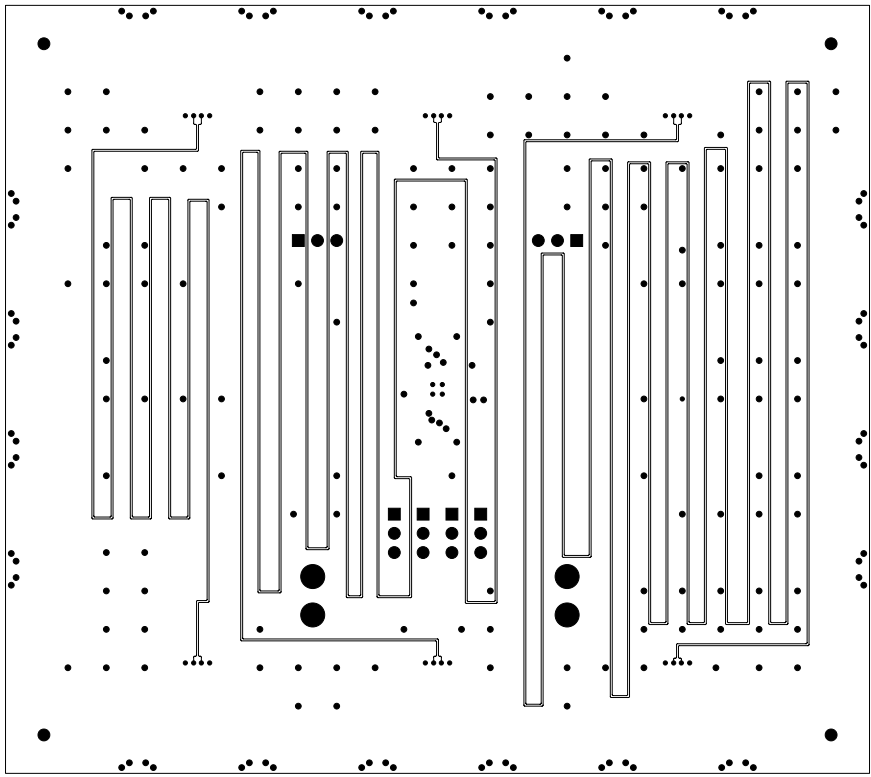
R1,2

C3,5,6

SMA9,10,11,12,25,26,27,28







LAYER 6 SIGNAL

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 TI 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. Information of third parties may be subject to additional restrictions.

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.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

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

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Mobile Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2012, Texas Instruments Incorporated